

Illumination Tutorial

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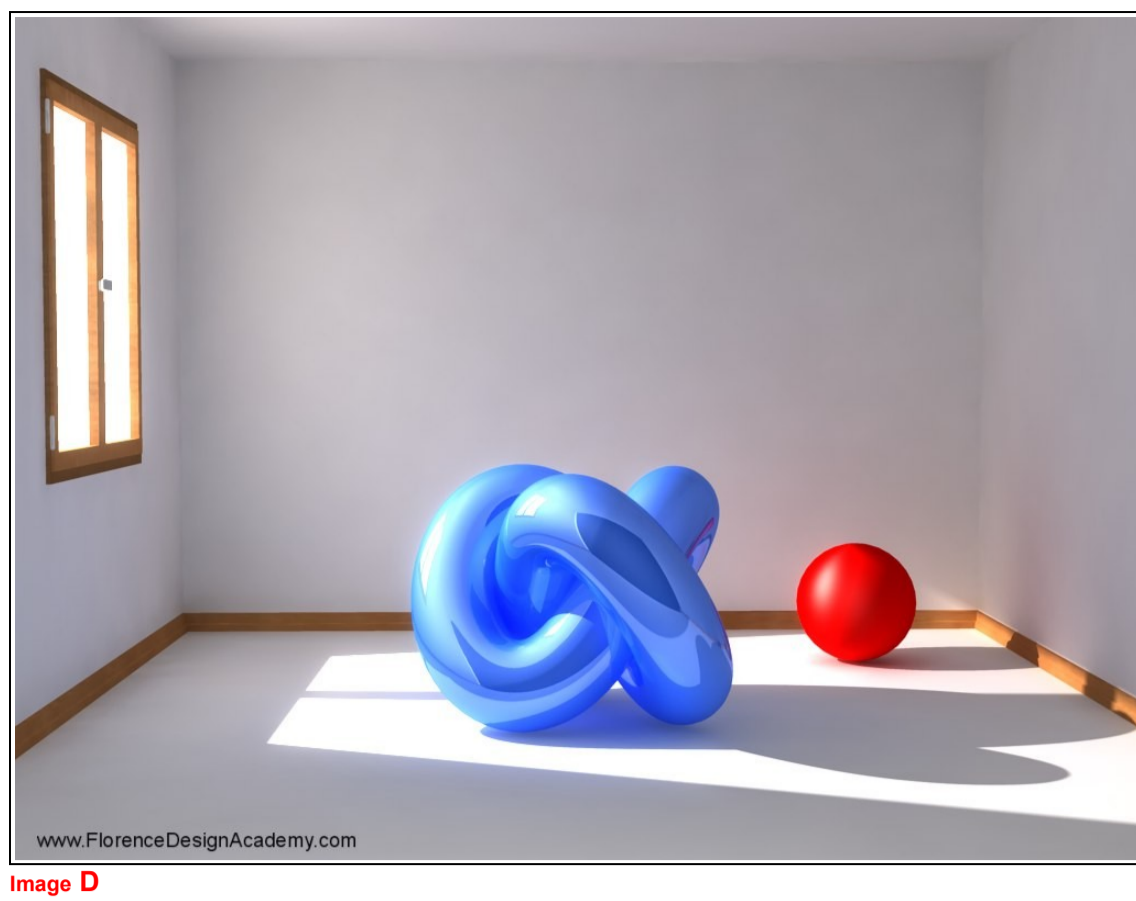


Image D

Dear Architects and interior designers, this is one of my tutorials that I wrote for my students of the Florence Design Academy (www.florenceacademy.com). This tutorial is about the illumination of a room which is illuminated by sunlight coming through a window (ideal for living rooms, kitchens and bedrooms). There are many different illumination techniques that I teach for a interior-rendering. This one is quite easy. We will use 2 different kind of lights. One is the "MR spot light" and the other is the photometric "free area light". Before we begin it is very important to inform you that we will use "mental ray" as render engine (3d studio Max 8). Mental ray is a very stable render engine, and it allows to have very realistic renderings. Since we are using Mental ray for this tutorial it is very important to use "real measurements" for all the interior/furniture that we have to create. Otherwise the result will not be optimal. It would be important to have already a bit experience with the mental ray settings since this tutorial will not explain all settings (settings about rendering and materials are in other tutorials of the FDA).

The first light (mr area "spot" light) must be located outside the room. You must move the target of the light through the window and place it inside the room (like on image 1).

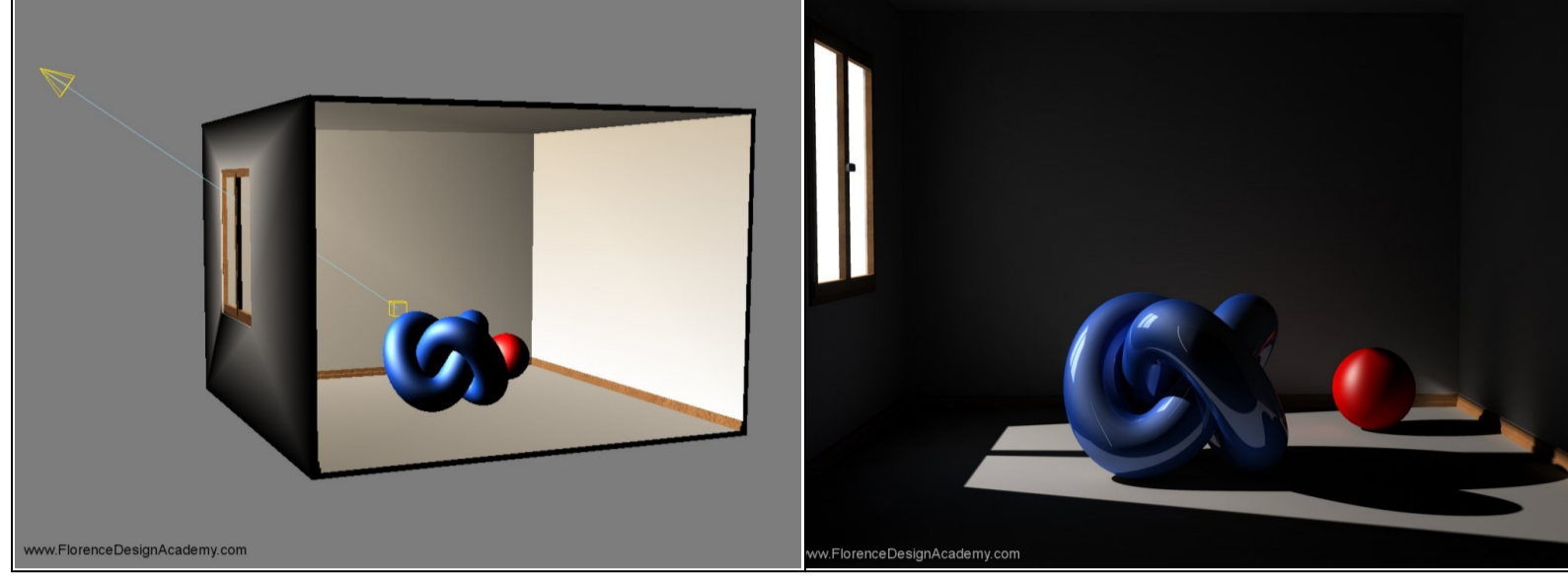


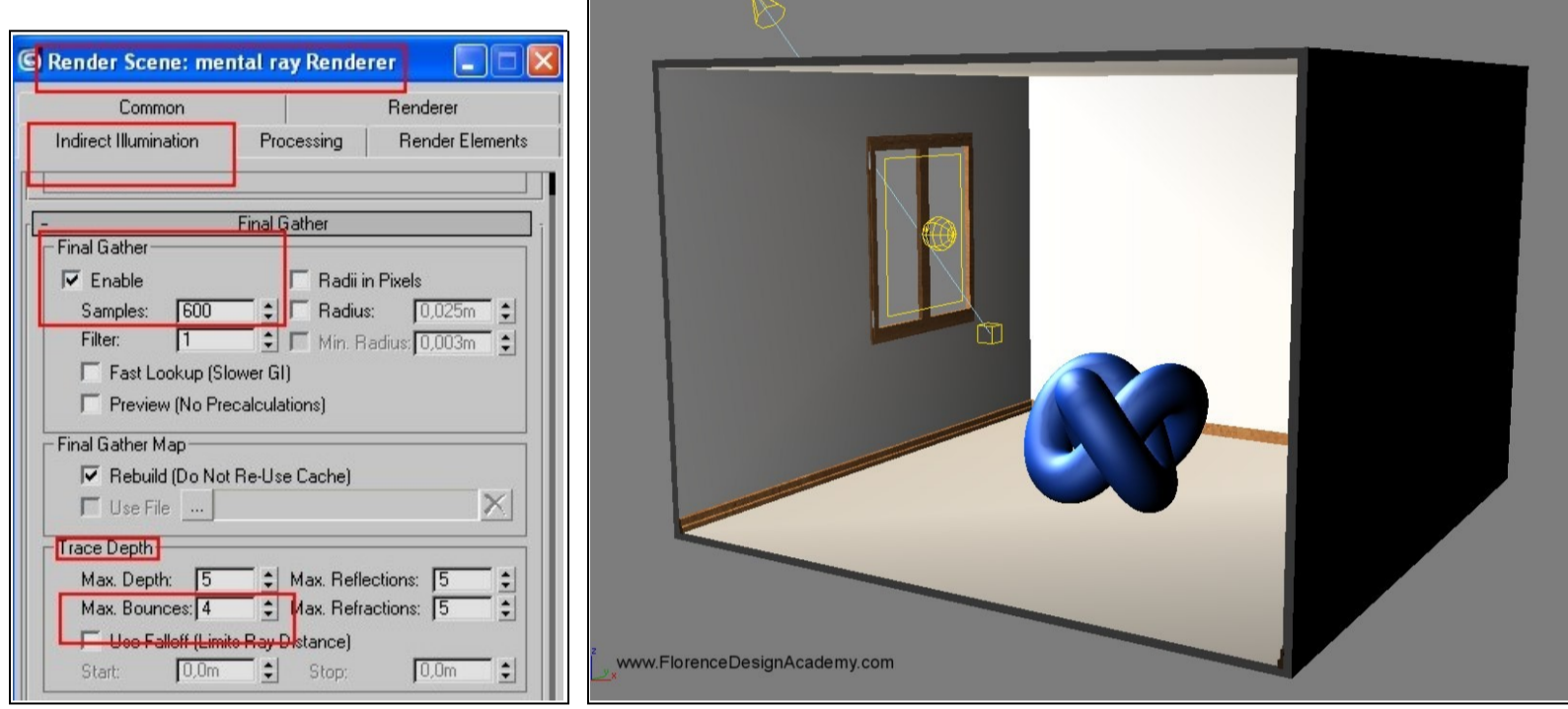
image 1.)

A.) First rendering with only a mr area "spot" light + Final Gather enabled

Let's see a few settings. Select the light and go to the **modify** panel. Over there check "shadows on" and select ray traced shadows (this is necessary whenever you will make renderings with mental ray). I put in the multiplier slot 0.8, but this doesn't mean that you must have the same number since later we will add other lights which will influence the brightness of the room. Change the colour to a very bright orange-yellow colour to simulate the sun rays colour. In "Area light parameters" (modify panel) you have the possibility to make the shadow softer increasing the size (height,width) of the light. To give the impression that outside the room the environment is very bright (like in the final rendering -image D-) you must create a big white self-illuminated box in front of the window. After this step select the "mr area spot light" and exclude (In the Exclude-panel from the modify panel) the self illuminated box from illumination+shadow casting. Otherwise it will create a shadow in the room. Try now to make a rendering.... It will be quite dark...

How can we make more realistic our rendering ?.... Let's go to the "render scene panel". Choose indirect illumination. Now check the **Final Gather** box. Put a low number in the Samples slot (50) to make a quick test rendering and see the difference. It will be similar to image A. For higher quality you must increase the number of samples. In my rendering I put 600 (this will take more render time). Don't put more than 1000 samples. You don't need such big numbers for a final rendering. Try to go up with the number making small test renderings. First try 150...than 250... than 400 etc. Let's increase the realism of the rendering. Still under final gather there is a slot called -trace depth- "max bounces" where we can increase the number. Let's put 4 (never use more because it will take really really too much render time). This option Sets the number of times diffuse light bounces are calculated for a single diffuse ray. In other words: it allows us to have the same energy that we can see when sunlight is illuminating a room. Now you should have more or less the result of image B.

Let's add a new light.(image 2).



Mental Ray Settings

(image 2) mr area "spot" light + free area photometric light

Create a "free area" photometric light (without shadows) in front of the window (it must be inside the room).The size should be a bit smaller than the window. I set the luminosity to 1500 CD. Try to make experiments reducing and increasing the intensity. The illumination depends also on the size and the position of the lights that you are using. You should have now a rendering like image C.



(Image B) rendering with only a mr area "spot" light and max bounce 4

(Image C) rendering with a mr area "spot" light + free area and max bounce 4

The illumination is quite good for now but we must give the impression of more luminosity. It becomes dangerous if you try to increase too much the first 2 lights. In fact you will risk to "burn" all the rendering. We can improve the rendering adding a last light. Create a free area photometric light in front of the Room. Normally I delete a wall and create a camera to render better a interior. Create the free area photometric light (without shadows) in front of the deleted wall (image 3).

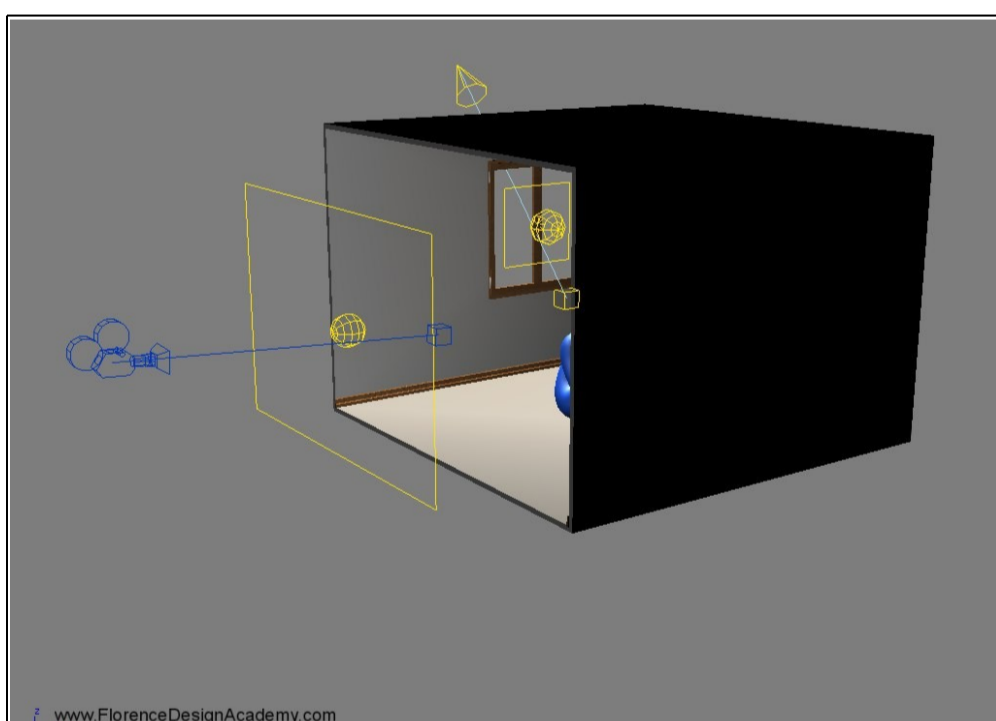


Image 3.)

The size must be smaller than the size of the wall that you have deleted. Don't locate it too close to your room, leave a small space between room and light. Otherwise you will "burn" the surfaces which are too close to the light. I Put around 850 CD in the slot for the Intensity. Try to Make a test rendering. You should have this result of Image D.

The result of the illumination depends not only on the intensity but also on the size of the light that you create. You will notice that increasing the size of the area light you will have more or less the same effect of increasing the intensity number.

The last step that you can do to improve the realism is to add a "glare" filter. This will give a glowing/shiny effect on the brightest parts of your surfaces.

Try always to change settings trying to discover the optimal balance of size/location/intensity of the lights. I tried this tutorial with success also on interiors with more than 2 windows... for each window add a small area light and a spot light.

Problems, errors and solutions : f your rendering is too dark probably you must increase the intensity of your last free area light, or you must increase the size of the free area light.

-Color-bleeding effect : to avoid this effect put a lower number in "max bounces".

-To long render times: This kind of illumination requires really a long render time. To spend less time you can reduce the "max bounces" number to 1 or 2 and make a bit brighter all lights.

-The rendering is full of big dark dots : this happens if in final gather you have a low number in the samples slot.

If you still have this imperfections (image E) after you have increased the number of samples try to add a bigger number in Final Gather **RADIUS** slot.

-How to make **VERY** fast test renderings: Make the rendering size small (example: 100*75 pixels).It will be for sure too small to see details, but you can clearly see if the illumination of the room is too dark or too bright.

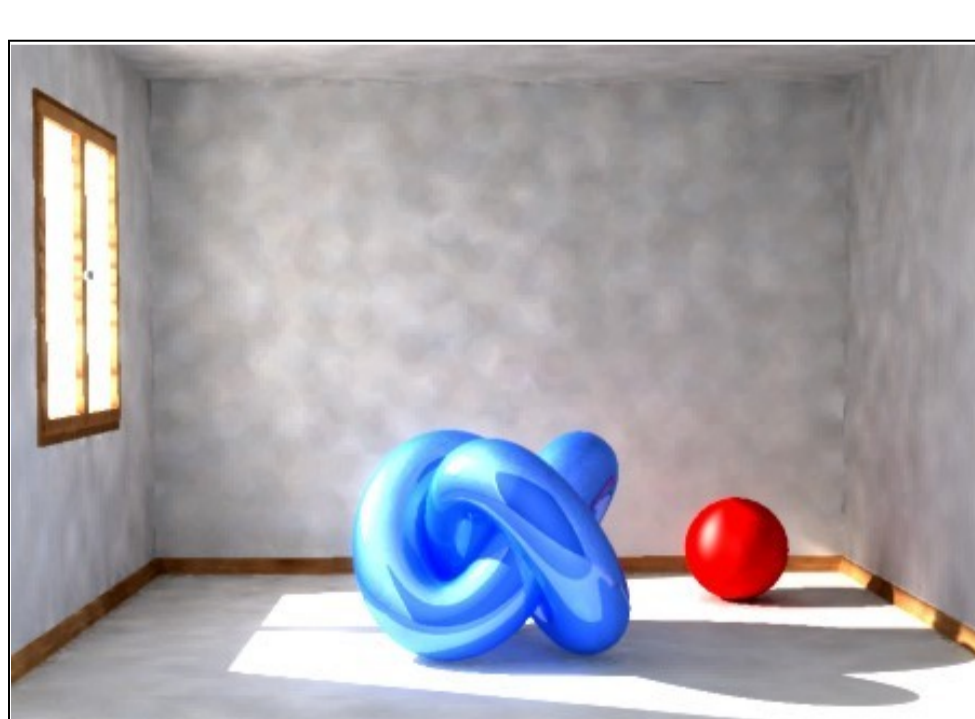


Image E

Ps: Remember that this tutorial teaches a technique of illumination, not what values to put in the light parameter slots. Since the final result of the rendering depends by the size of the room ; the intensity, the color, the size and the location of the lights, you must do many test renderings and experiments to get the correct values.

I hope this tutorial was useful for you :)...Best regards

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Rendered with the same technique

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