



supodium tutorials

podium lighting tutorial

a step by step guide to creating light fittings and setting up lights

Introduction

One of the subjects that attracts the most interest, comments and questions is lighting. After all, at the end of the day no matter how good your model is, poor lighting will lessen the impact of your finished render.

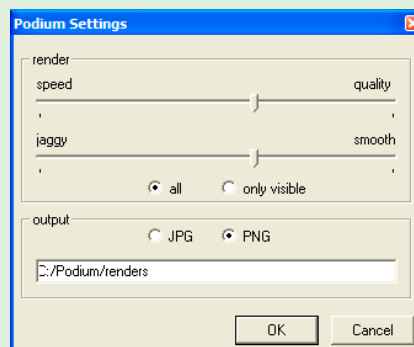
This tutorial deals specifically with artificial lighting and will explain how lights work, how to use them efficiently, and how to create your own fittings.



A sample light fitting render.

Before we start...

We'll assume that you are familiar with the Podium dialog box, and what the controls do. I have set the jaggy and quality settings to around 60%. This gives a reasonable balance between speed and quality. I would suggest you use these settings for the moment.



Podium setting dialog box.

Basic LEM Setup

There are two basic types of lights in Podium. The first and simplest type is a light emitting material usually called a LEM. This is simply a surface which emits light evenly across its area.

The advantage with this type of light is that it is easy to create. This is illustrated in Figure 1.

We have created a simple rectangular surface in the centre of the scene. I have assigned a light strength of 20 to this surface by using the Podium slider and rendered the scene. You can try this yourself by downloading the test scene [here](#).

You can create any shape of light you want. LEMs are particularly good for creating linear lighting effects like pelmet lighting.

In Figure 2, I have taken the ceiling surface, offset and extruded it to create the lowered ceiling. I have then assigned a light strength to the ceiling plane.

So far, everything has been very straightforward. Next we'll make the light a colour. Create a new material in the materials editor, and paint the light-emitting ceiling with it. I have chosen a nice blue colour which is illustrated in Figure 3.

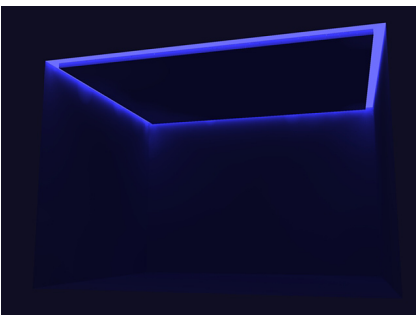


Figure 3 - An example of coloured lighting.



Figure 1 - Basic rectangular LEM.

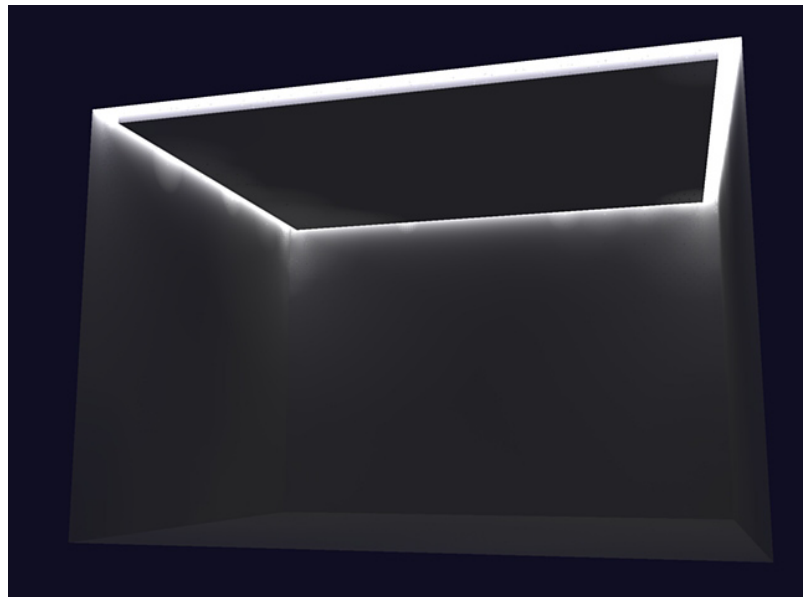


Figure 2 - Using an LEM to create a linear 'pelmet' type light.

Basic Omni Setup

By now you may have noticed that the render takes a long time, and this is with just a plain rectangular room with nothing in it! This illustrates the big drawback of LEMs, they render very slowly indeed, and currently we are only using 60% quality! You will probably also wonder what the blotches are around the corners where the walls join the ceiling. These are there because quality is only set at 60%, and should disappear/reduce at the maximum setting, although render time will increase noticeably.

It should be noted that square LEMs render more quickly than other shapes. This is just the way the renderer is coded.

So, easy to set up, but hardly convenient for fast and efficient renders. This is where omni lights are useful. The term 'omni light' is used to describe a light which shines evenly in all directions and comes from the Latin omni meaning 'all'. Some render programs call this a 'point' light. These aren't 'added' or 'inserted', but are created by making a group and assigning a light strength to the group.

Let's go back to the Tutorial scene and create one. The easiest way of doing this is to simply make a group of the square LEM. Figure 4 shows the Tutorial Scene in SketchUp with a small square in the centre of the scene. I have assigned light strength of 6 to the group. Note that you can change the colour of omni lights the same way as you assign colour to LEMs. Figure 5 shows how this scene renders.

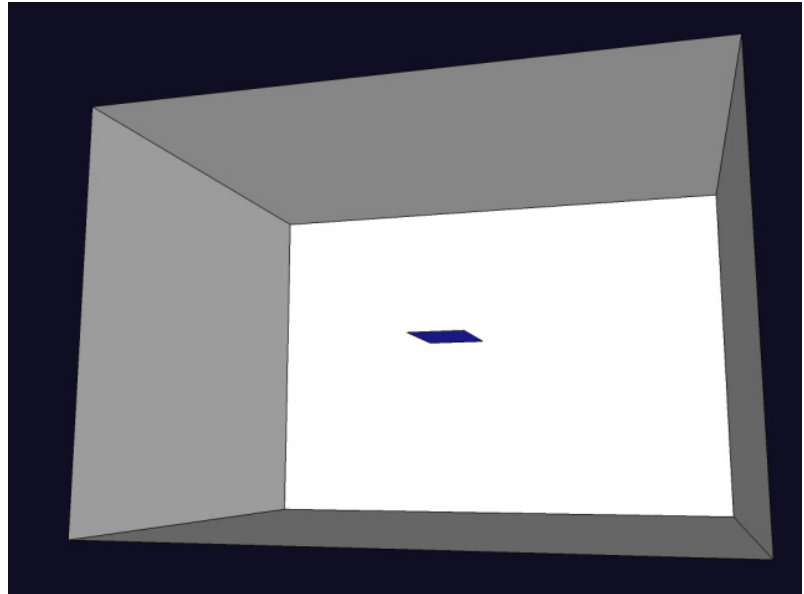


Figure 4 - Setup of omni light group.

Considerations

There are a number of important things to bear in mind here. We'll start with the most basic considerations.

- 1. It is the assigning of the light strength to the group not the actual geometry that creates an omni light.*
- 2. The shape of the group has no effect at all on the light. The reason we create geometry is to position the light in the model.*
- 3. The size of the light geometry multiplies the light strength. If you want a very faint light, you need to use really tiny geometry to create the omni group.*
- 4. The light originates from the centre of the group, and the intensity is greatest there.*
- 5. Omni lights generally don't need to be as powerful as LEMs to emit the same amount of light.*
- 6. To make an omni light coloured, as with light strength, you assign the colour to the group, not the surface geometry. In fact if you try to assign a bright yellow colour to the faces in the omni light, and a blue colour to the group, the light will render blue. To make it render yellow, you have to make the group yellow. To check your omni colour, select the group and look at the colour in the entity info box.*

You can see that there is no geometry visible at all. If you have created the omni light as described, this is what you should see. Even if you have a light strength assigned to the geometry as well, just assigning light strength to the group will make the geometry invisible and turn it into an omni light. Straight away you should be able to see how quickly this type of light renders compared with the original LEM.

Notice that there are faint pools of light on the walls, floor and ceiling. So far, so good. To increase lighting levels we can increase the size of the group. Figures 6 and 7 show the effect of just making the group larger.



Figure 5 - Basic omni light, strength 6, located in the centre of the room.

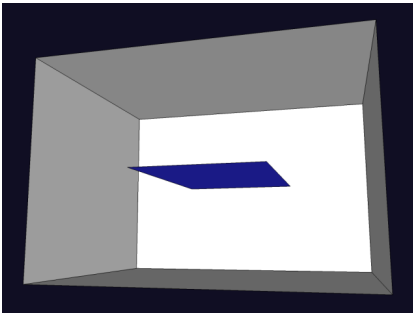


Figure 6 - Basic omni light enlarged, strength 6, located in the centre of the room.

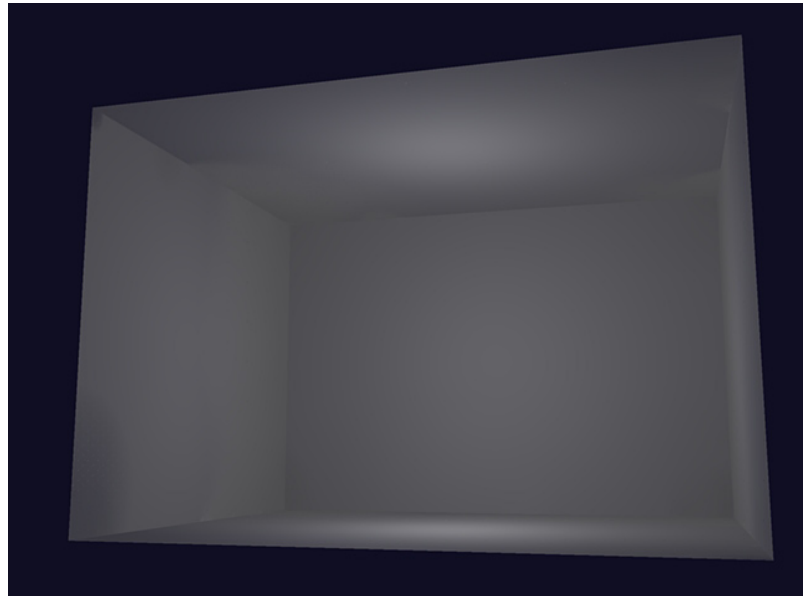


Figure 7 - Enlarged strength 6 omni light.

Let's go into a bit more detail now. So far these lights have been in the very centre of the room. Let's go back to the original omni light size, move it towards the rear wall and see what happens. Figure 8 shows the omni light moved to within 200mm (8") of the rear wall, and Figure 9 shows the effect of this when rendered.

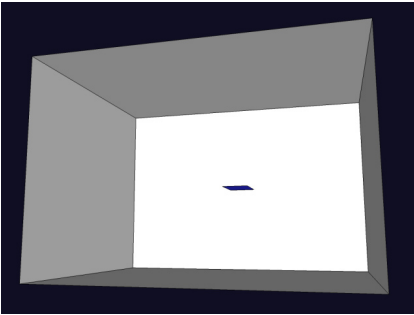


Figure 8 - Basic omni light from Figure 3, moved towards the rear wall of the room.

Now there is a noticeable bright pool of light on the closest surface. Let's try to minimise this a little by scaling the omni down and see exactly how much control we can get over the amount of light emitted.

We'll scale down the omni group even more and make it really tiny, and adjust the strength slider ever so slightly above 0. Although the strength may still read as 0 the light will still have an actual value. Figure 10 shows that the omni is so small you can't even see it in the screenshot, and Figure 11 shows the effect when rendered.

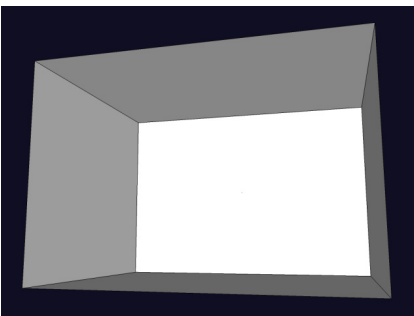


Figure 10 - Omni light above reduced in scale so as to be invisible unless zoomed in close.

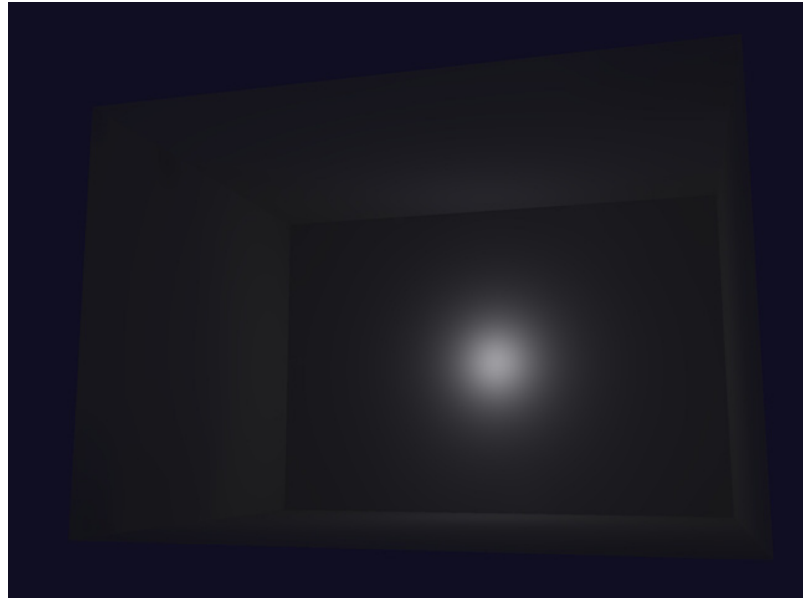


Figure 9 - Rendered view of the scene from figure 8.



Figure 11 - Render of the scene from figure 10.

Creating a Light Fitting

Okay, now we know exactly how much control we have, we can start to use this information to make an actual light fitting. Let's start with a simple ceiling-mounted pendant light. You can download a simple tutorial light I have already modelled [here](#) shown in Figure 12 or model your own and follow the procedure outlined below to set it up.



Figure 12 - Basic ceiling-mounted suspended fitting.

We need to insert an omni light source into the fitting now. Figure 13 shows I have inserted a small pale yellow omni, which I have set as strength 6.

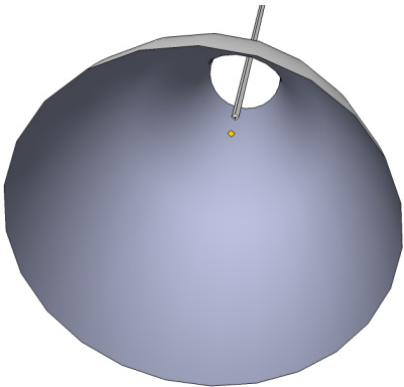


Figure 13 - Above fitting showing size & colour of omni group.

We'll use the original tutorial scene again and insert the fitting into it to render. This is shown in Figure 14.

This obviously isn't strong enough, so I have increased strength to 25 and re-rendered. This is shown in Figure 15.



Figure 14 - Render of the above fitting at strength 6, inserted into the tutorial room scene.



Figure 15 - Render of the above fitting at strength 25.

That looks pretty good, but it would look even better with a scalloped effect on the wall. This is actually really easy. As you saw in Figure 13 the omni light is positioned so that it is quite deep within the fitting. This is one of the keys to getting a good scalloped effect. The second thing is to make the body of the fitting reflective so that the shape acts as a reflector. Finally, in order to see the effect, you really need a light fitting to cast light onto a surface which is fairly close so we'll move the fitting closer to the wall. Figure 16 shows how I have modified the size and position of the omni Figure 17 shows how it renders.



Figure 16 - The fitting showing an enlarged and repositioned omni

Just as in real life, the shape of the scalloped effect depends on the strength of the light, shape of the fitting, how deep within the fitting the light source is positioned, and how close to a wall the light is. You will need to experiment with this by trial and error until you get the effect you want. The same principle applies to all types of lighting, including recessed ceiling lights.

So far, so good. However this is a fairly simple type of fitting. Let's make it a bit more subtle by making the shade frosted glass. First of all, we'll go back to the original tutorial fitting, before we adjusted it to create the pattern on the wall. I have created a fairly light grey material for my shade, assigned a transparency of 90 and reflectivity of just 6. Figure 18 shows how this renders.



Figure 17 - Rendered view of the modified fitting showing the scalloped pattern on the wall.



Figure 18 - Initial rendered view of the fitting with a translucent glass shade.

Light distribution is fine, but the effect is hardly subtle, we haven't exactly got that nice soft glow we were hoping for. Let's reduce light strength and try again. Figure 19 shows what happens when we set the strength back to 6.

This is much better, but the scene is too dark. We need to find a way to increase the overall lighting level without affecting how the fitting looks. The easiest way of doing this is to add another omni light sufficiently bright to light the room, but far enough away that it doesn't wash out the effect we have tried to carefully achieve with the fitting. Figure 20 shows that I have copied the original omni light below the fitting. Because they are tiny, you might not see them at first, they may look like specks of dirt on your monitor! It is highlighted here by the small circle.

I haven't adjusted anything, just copied the original. Figure 21 shows how much better this looks.



Figure 20 - View of the fitting with the original omni copied below to boost light output.



Figure 19 - Rendered view of the fitting with reduced light strength.



Figure 21 - Rendered of the modified fitting with the extra omni light.

If you want the scene brighter you can increase the strength of the second omni light, but you need to make sure that you adjust the location of the omni group so you don't affect the fitting or get a noticeable bright 'ring' on the floor or indeed any other surface which may be too near to it. Figure 22 shows what happens when you move the fitting too close to an adjacent surface.

You can experiment with materials for this fitting to get different effects. Spun aluminium or an opaque reflective glass can make a noticeable difference.



Figure 22 - Rendered example of omni light 'burnout' when the light is too close to a neighbouring surface.

Advanced Techniques

Now that we have made a fairly nice fitting, let's get a bit more ambitious again and try modelling a more complicated fitting.

I have created a very simple spot light component from the pendant fitting. If you [download](#) and open Light Tutorial fitting 2.skp, you will see that I have kept the same basic shape, but rescaled it so the diameter of the spotlight body is just 75mm or 3". Small fittings are much harder to get right than larger ones. When you simply insert a tiny omni at the minimum strength into the fitting, you get results like those in Figure 23.

Although we have inserted the omni light well inside the body of the fitting, you can clearly see that the pool of light on the ceiling looks like the omni isn't inside the fitting at all. This is the way that omnis work.



Figure 23 - The effect of locating omni lights inside small fittings close to neighbouring surfaces at minimum strength.

At their lowest power, they cause burnout when they are placed close to any surface. The minimum distance that you can place any omni at in order to avoid this burnout effect is between 200-300mm (8-12"). Fortunately we can overcome this to an extent by working around the problem.

What we are going to do here is move the omni far enough from the fitting to avoid burnout, and make it as faint as possible. We will simulate the bulb glow with an LEM. This will take a little longer to render, but it really is the only way we can render small fittings at the moment. Figure 24 shows how I have set up the spotlight.

The omni group is approximately 400mm (1'4") away from the fitting with strength set at 2, the circular LEM has a light strength of 12. Figure 25 shows how the fitting renders.

This isn't quite perfect, but it does look a lot better than the fitting in Figure 22.

You will notice how the omni casts a shadow on the ceiling because it is located in front of the fitting. Currently there is no way around this directly. However for most buildings unless you want a really dark, moody scene, it is likely that you will have other lighting as well, which should illuminate the ceiling and hide this shadow to an extent.

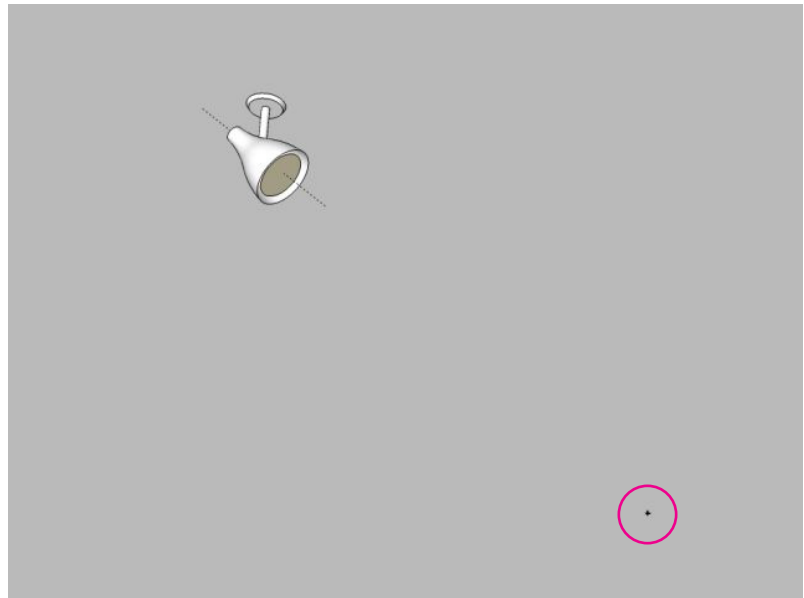


Figure 24 - Revised spotlight setup to avoid burnout. The omni is highlighted in magenta.

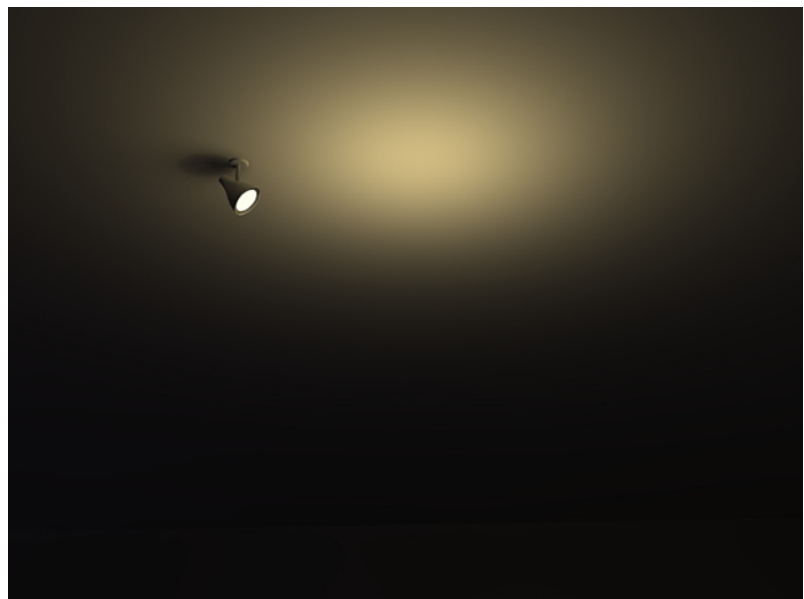


Figure 25 - Rendered view of the completed fitting.

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