Three Point Lighting

An Art of Illusion tutorial..

Lights can make your five-minute MyFirstRender™ look like a masterpiece that must have taken hours. But a bad lighting rig can also make your skillfully modeled scene look like a Hall-of-Shame-work that couldn't have taken more than five minutes to produce.

Following is my attempt to reveal some secrets about lights. Lighting your scene properly is not necessarily difficult. It's more often a question about the time that you have to spend arranging the lights the way you want them.

I decided to show you how to create basic three point lighting for your scene. There are already many tutorials about three point lighting for nearly all software packages. Three point lighting is also commonly used in theaters and movies. Many photographers use it too, and why wouldn't they? It is easy to set up and it gives good results in most cases.

Also keep in mind that there is no absolute positions for each light. This tutorial shows one way to create it and if you take a glance through other tutorials (recommended) you will notice many different versions of Three Point Lighting.. and they are all as good..

Overview to lights

There are three types of lights that you can use in AoI. You can create them all with same tool: the light tool in the toolbar.

The Light Tool

They are **Point Light** *(click)*, **Directional Light** *(drag)* and **Spot Light** *(Ctrl+Drag)*.

You can adjust a light's intensity, color, etc. either by activating its properties menu or by double-clicking the light's entry in the object list.

Different types of lights

A Directional Light illuminates the scene with sharp sun-like light. AoI puts one light like this into every scene by default. Usually you don't need it after you add other lights to the scene, so you can delete or hide it. :-)

You can adjust a Directional Light's Color and Intensity.

The Point Light is very useful light. It is simply a point *(or an invisible sphere)* in the air that radiates light to every direction around it. I light most of my scenes with these.

You can adjust point light's Color, Intensity, Radius and Decay Rate.

A Spot Light is a light that creates a cone-shaped light beam. If you point a spot light directly against the wall it illuminates a circular area of the wall. Most of the lights used in theaters and stages are lights like this.

You can adjust Spot Light's Cone Angle, Falloff rate, Color, Intensity, Radius and Decay Rate.

What do all these buttons and values affect?

Let's take a look at the Spot Light's parameters. The Spot Light contains all the parameters found in other lights, so we can find all the lighting parameters in one place if we edit a spot light.

You have created a Spot Light by Ctrl+dragging and now you want to do some fine tuning. Double-click the Spot Light on the Objects list and nice looking dialog box jumps up. It looks like this:
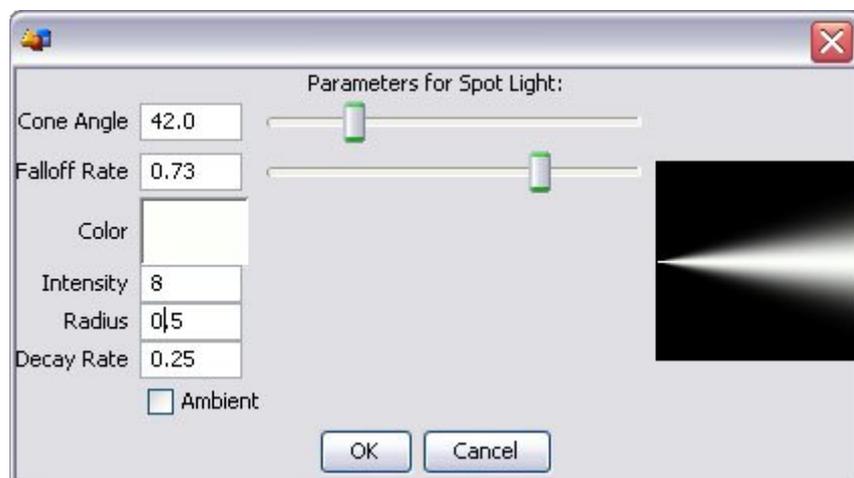
And here are some short explanations for all the buttons and numbers..

Color = Color of the light. Click the white box to change the color. Usually only hue and saturation is needed to change Value can stay up to one..

Intensity = Brightness. This value describes the amount light coming out of this source. Default value is 1 and usually more is needed.

Radius = The size of the light source. Usually 0.2 -0.6 is suitable. Small radius creates sharp shadows and large radius creates soft and blurry shadows *(assuming you enable Soft Shadows when you render)*. Light with very large radius *(>2)* can cause noisy renders..

Decay Rate = Practically the amount of light that is lost in the way from the source to the object *(and camera)*. Default value is 0.25 which is quite ok in most cases. Setting this to 0.0 will let you use very small intensities to light a scene, so that Lights leave no hotspots to shiny and specular objects. On the other hand using huge DecayRates *(i.e. 0.6)* will let you use huge intensities to create beautiful hotspots without getting over exposure problems when rendering..

Cone Angle = How wide the Spot Light's beam is.

Falloff Rate = How soft edges the beam has. *(Well. Not exactly. But you can figure it out the best by simply messing around with it. So please, do mess around with it.)*

:-)

Setting The Three Point Lighting

Finally we get to the point. All three of them. So...

You've made a nice model and maybe some scene around it and you want to bring some lights in the darkness. If you don't have a scene of your own you can borrow mine. It's the one I've used to create this tutorial. **You can download it here.**

Delete or hide the default light and set the ambient color to black. *(Scene > Environment > ...)* Just to eliminate all unwanted light.

You can also do some tweaks for the renderer since setting lights usually needs quite a few quick test renders. At least set the Antialiasing to medium and check the Gloss/Translucency and Soft Shadows check boxes.
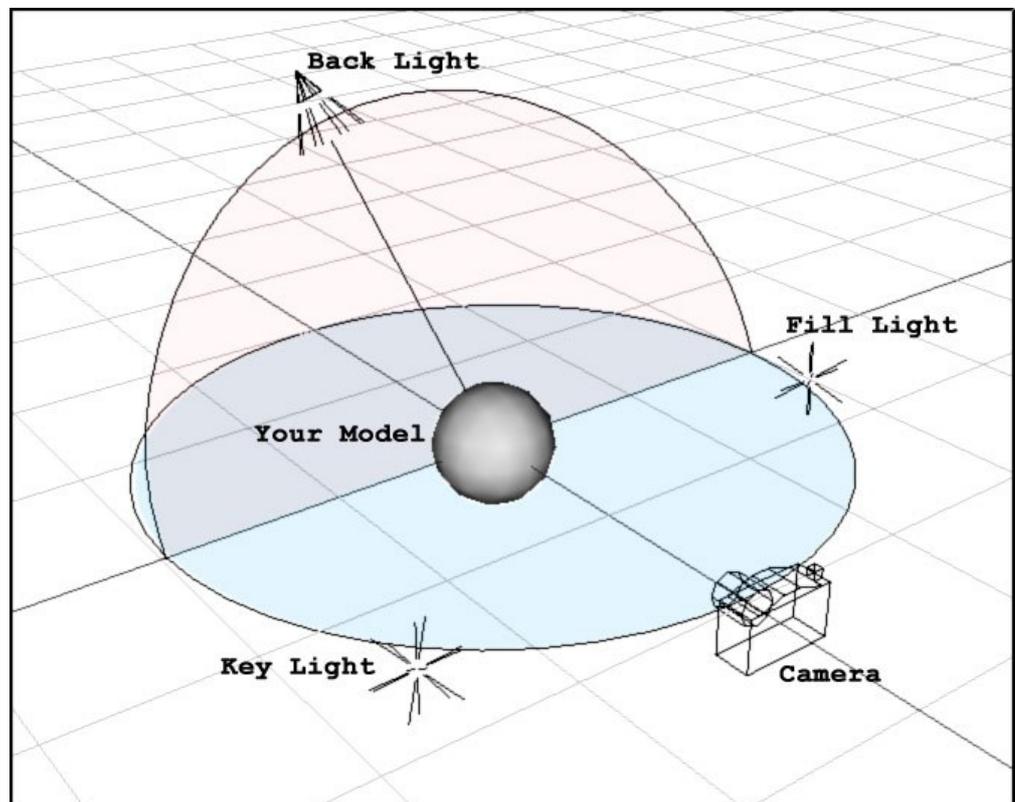

Here is a simple image showing the positions for each ight. It's a bit simplified but it shows the idea.

And now..

The Key Light

The Key Light is the main light of the scene. It should light up a bit more than a half of the object(s) you are planning to render. Traditionally it's quite bright light and it's placed nearest to the camera. Little bit to up or down and left side from camera.

Let's use a Point Light here. It makes things a bit easier. Create a Point Light and rename it to Key Light. Take a couple of test renders to fix the intensity to a suitable level and set the color. Warm yellowish white is good.
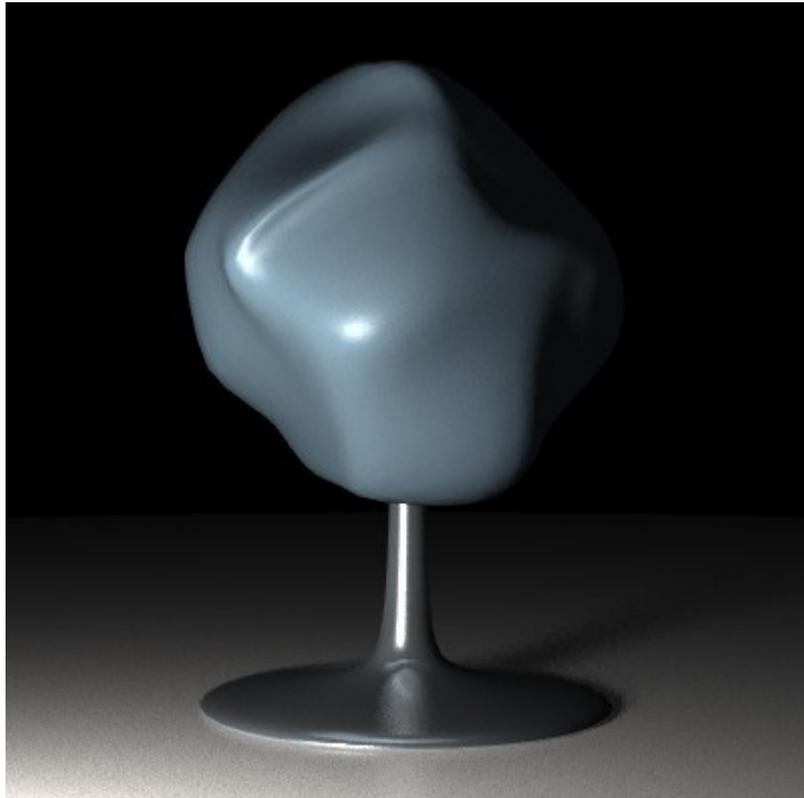

Key light on

The Fill Light

The Fill Light is meant to gently light the parts of the model that are left over from the Key Light. So we place a Point Light to far right, a bit up or down from the camera and rename it to Fill Light.

Take some test renders to place light and set the intensity. You may also want to try a bit larger radius and different colors.. I often use very slightly blueish white for Fill Lights. After you've set The Fill Light You propably have to tweak the Key Light too.
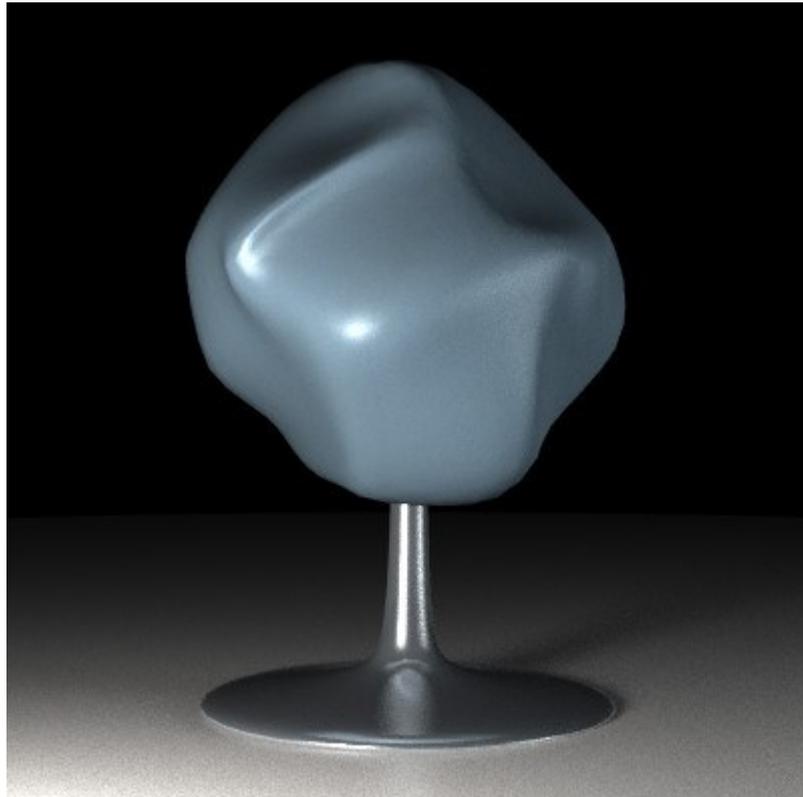

Key and Fill Lights on, Much better. Now some shine and glow..

The Back Light

The Back Light's job is to reveal the edges of the model and separate it from the background.

This time we use a Spot Light. You could also use Point Light and you should if there are many objects to light, But here we have only one so let's make it Spot Light so that we can point the light where it's mostly needed.. Right?.

Place the Back light above the Object and little further from the camera than the object. Use narrow cone angle to light only the object, and also use huge intensity. Now you probably have to tweak all three lights a bit and take even more test renders to make them all work nicely together.
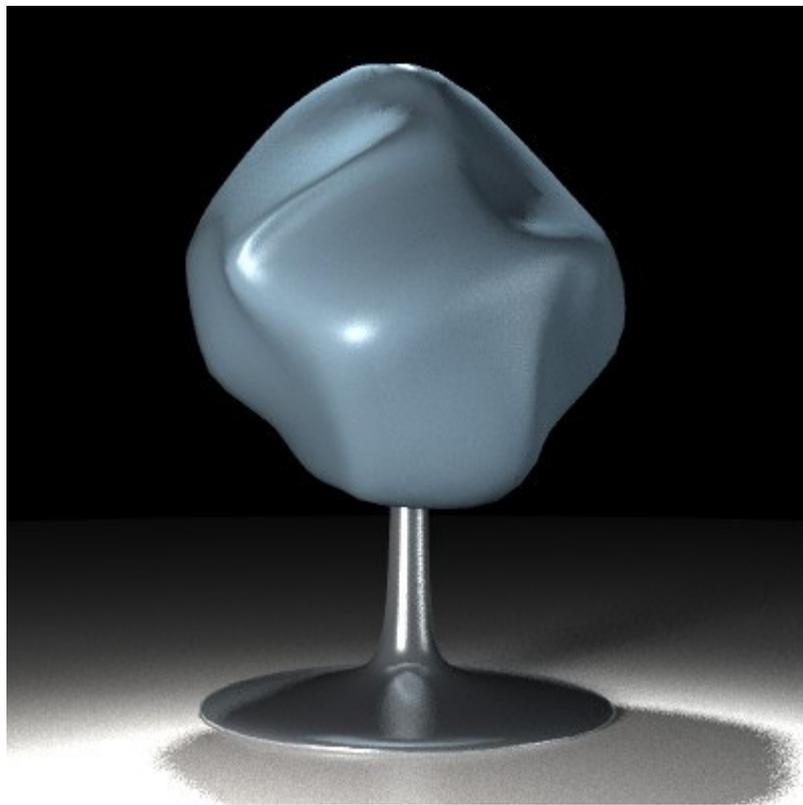
Key, Fill and Back Lights are on. Notice how the Back Light brings out the edges of the model.

..And voilá! You have all the lights you need. Of course you might have to keep working and tweaking for some time and you propably have to take dozens of test renders until you are happy with the result. But that's how it usually goes.

If you want to study the actual scene file with all the lights and tweaks feel free to do so. You can download it from here.

Tip!

It's easy to move Point Lights around the scene by simply dragging them where ever you want them. Point Lights shine in every direction, so you can even rotate them and it does no harm to the render..

But with Spot Lights this can be a problem. Narrow beam doesn't meet the target ever again after couple of moves and rotates. AoI users have presented several solutions to this problem and this is one of them:

Create a Null Object. *(Object > Create Primitive > Null)* estimate the distance where the spot light should be from the object and then Drag from that point to create the Spot Light to the the Null Object. Now yuo have narrow beam pointing the Null. Now draw a two point curve *(a line)* betwen these two objects.
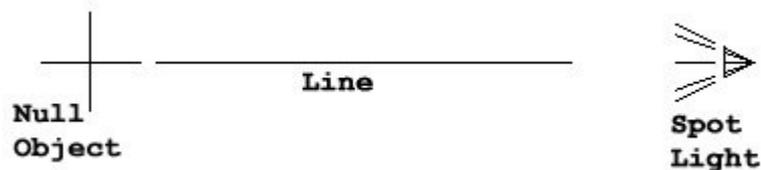
Make the Light and the line Child Objects to the Null Object.
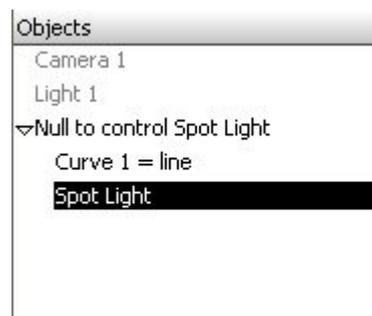
Now you only have to move the null object to the place that you want to illuminate and rotate it to change the direction of the light. *(Set rotate tool to rotate around parent object by double clicking the toolbar icon)*

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Thanks to Marc Carson for reading this through
and correcting all the many mistakes..