

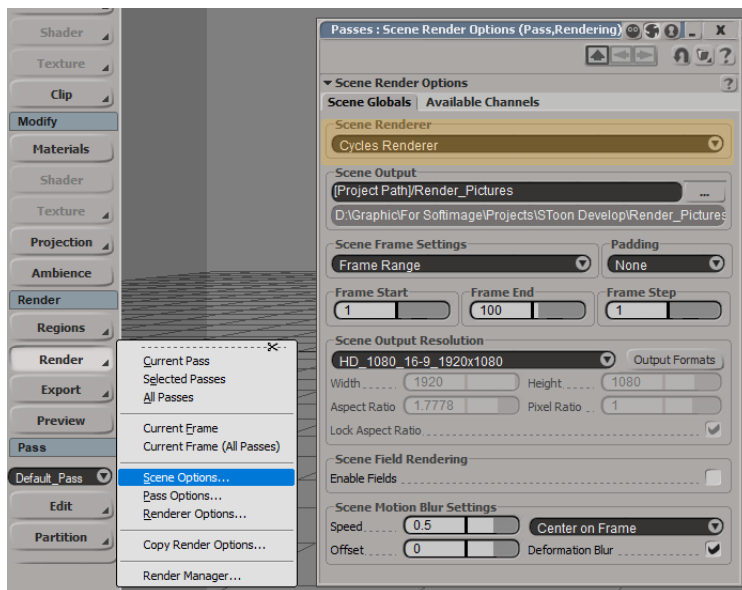
SToon

Short introduction

April 14, 2019

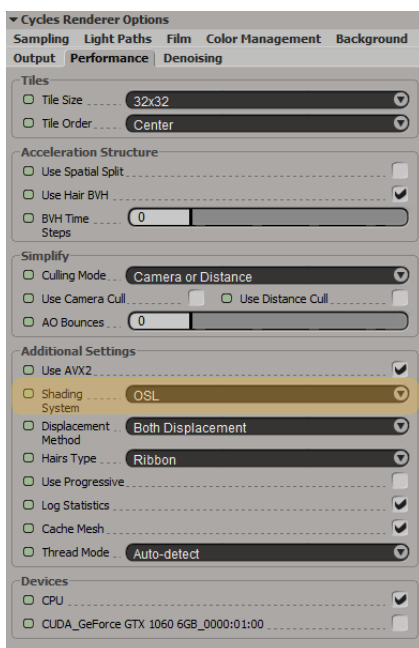
1 Typical scene render

As a first step, we should enable the using of SToon shaders. To do this, go to Render – Scene Options and choose as the scene render Cycles Renderer

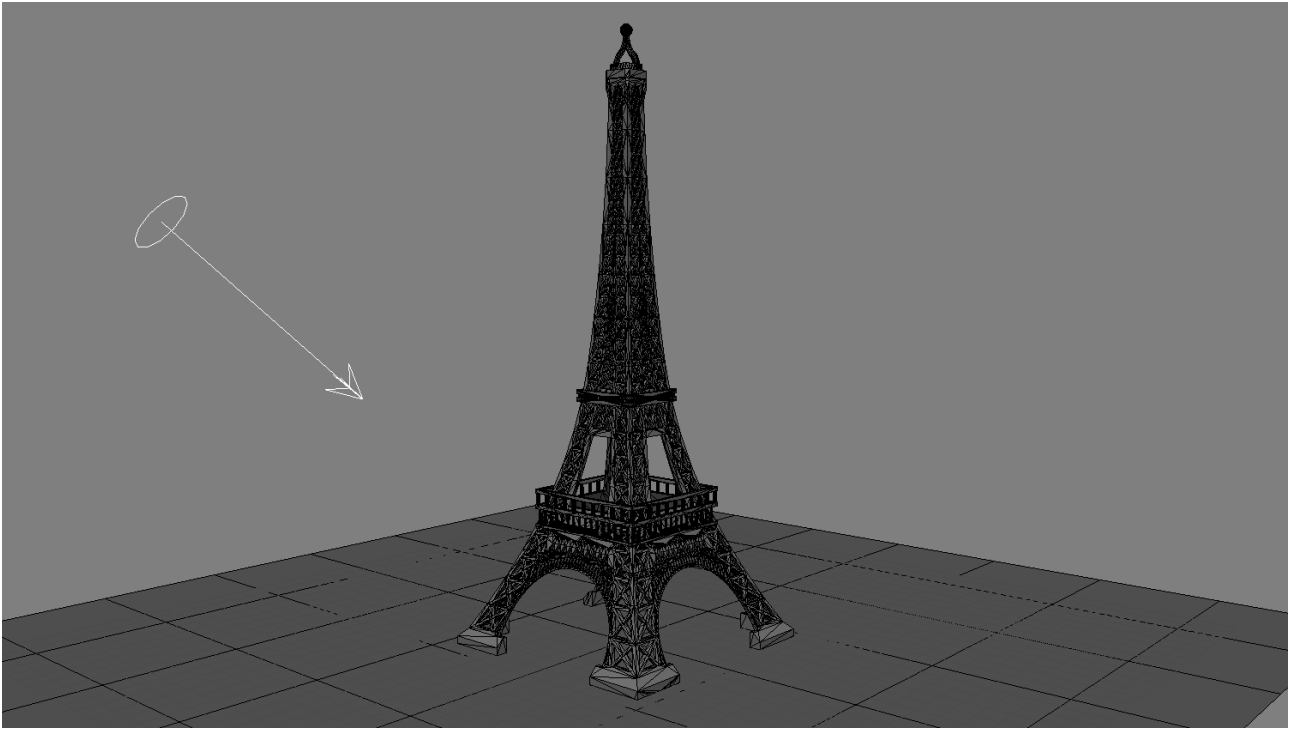


We should do this by the following reason. In the SToon addon, an event is called before the rendering of each frame begins. In this event all shaders of all materials of the scene are enumerated and some of them equipped with data about the sources of light in the scene. In order to avoid this enumeration when rendering by another renderer, the addon looks at which renderer is set as the main renderer of the scene. If it is Cycles Renderer, then the enumeration will occur. In other cases, no.

Next we should turn on the support of osl-shaders. It is because the SToon shading system is based on them. To do this, go to the render settings and in the Performance tab choose the value Shading System equal to OSL.

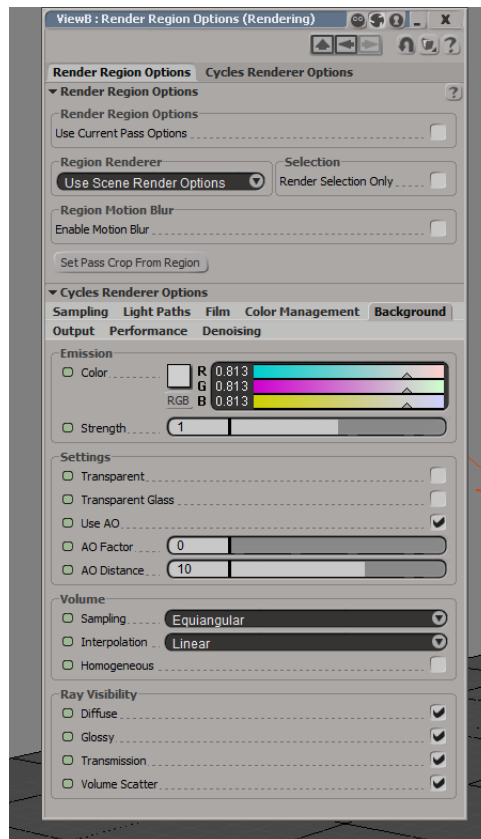


Now let's render. Suppose we have a scene with the Eiffel Tower, flat land and one directional light source.

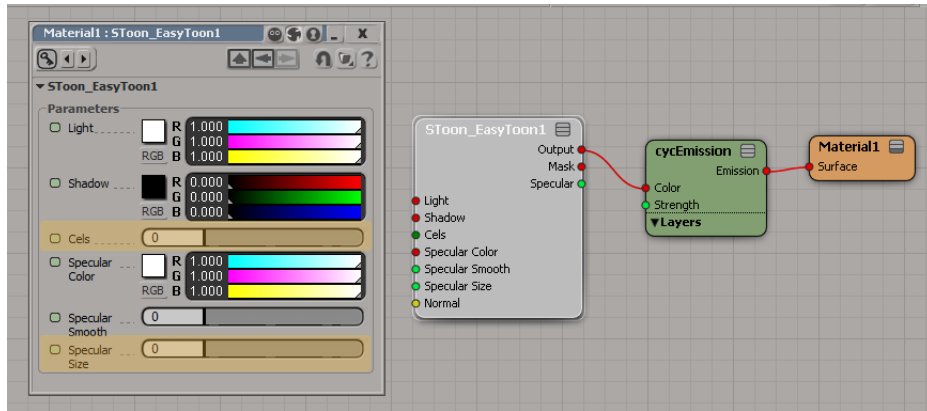


By the way, the SToon system supports only two types of light sources: **Point Light** and **Directional Light**. They must be light sources for **Cycles**. The rest are simply ignored.

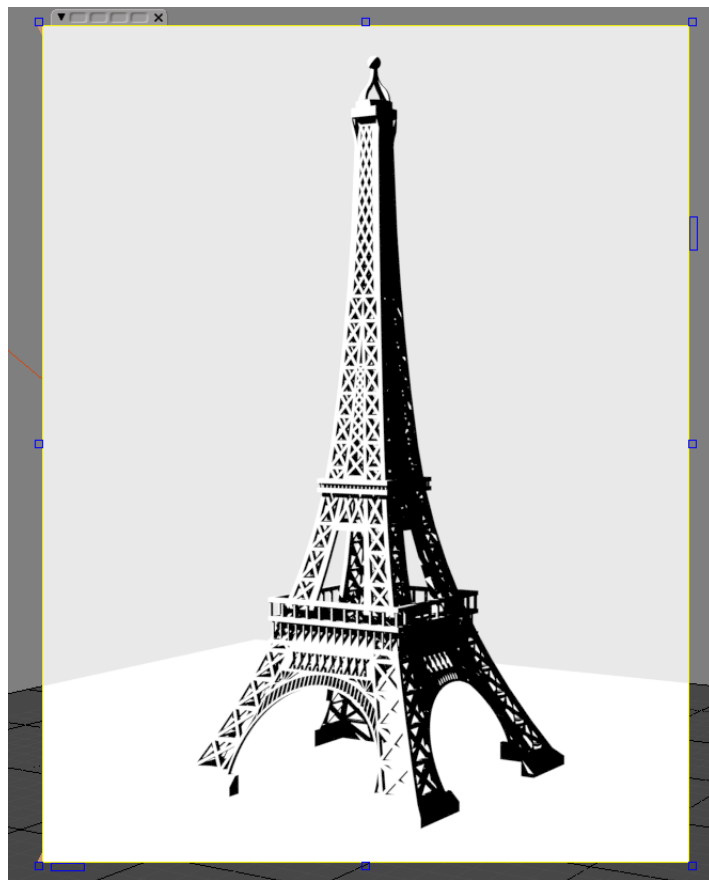
Go to the render settings and in the tab **Background** turn off the transparency and set the gray color as the background.



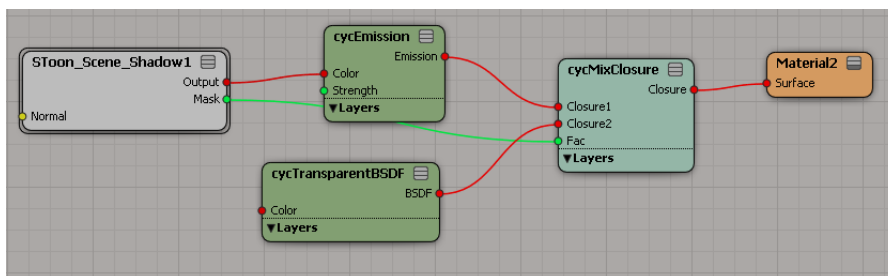
Assign a material with a **Emission** shader to the tower. Add a node **SToon EasyToon** and connect it to the node **Emission**. Set the parameters **Cells** and **Specular Size** equal to 0.



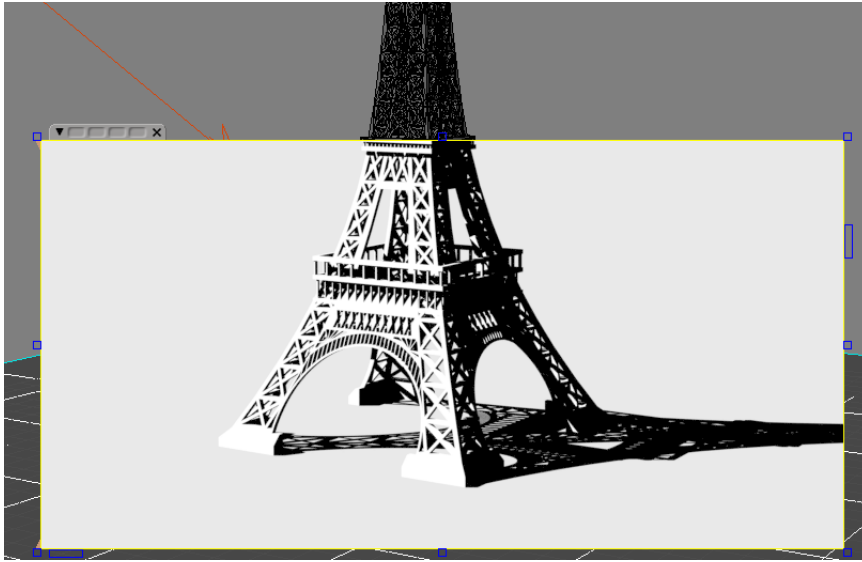
Assign to the plane material with a shader Emission and render.



It's bad, isn't it? It is necessary to improve it a bit. First add a shadows. To do this, add a node **SToon Scene Shadow** to the material of the plane, connect it to the node **Emission**. The output of the **Emission** mix with an output of a **Transparent** by the mask from the node **SToon Scene Shadow**.



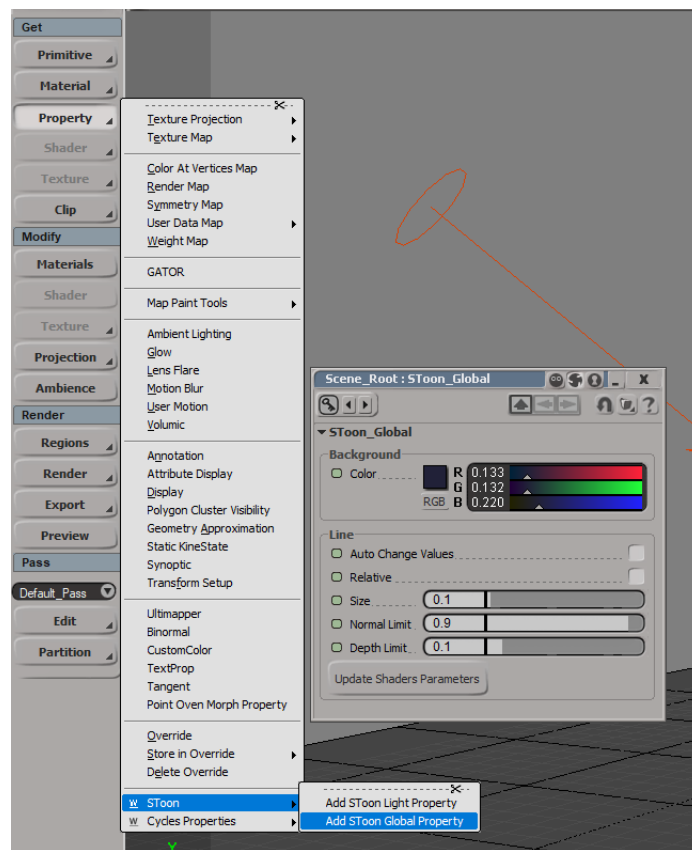
Render.



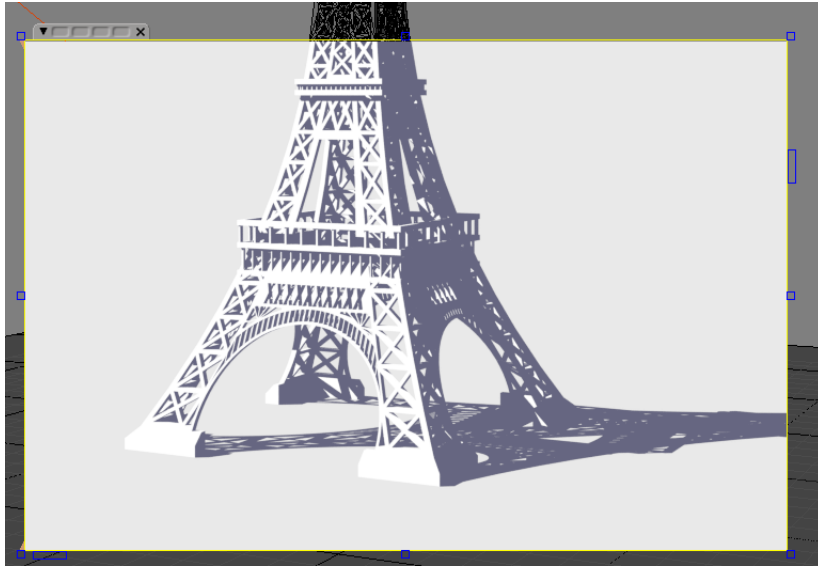
A shadow appeared, but it is black. Add some colors. Press

Property – SToon – Add SToon Global Property

and in the window that appears, set the dark blue color for the parameter Background Color.



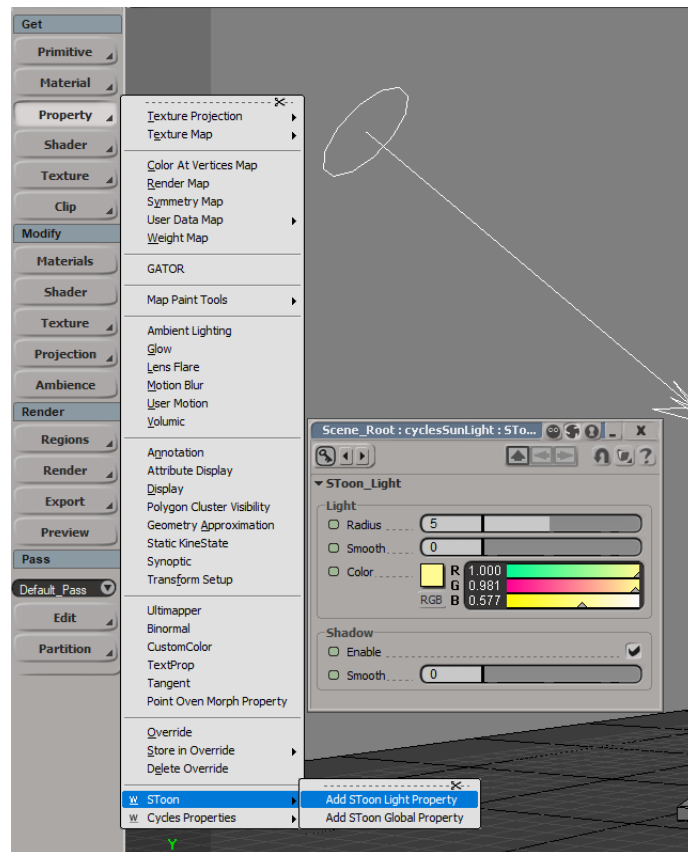
Render.



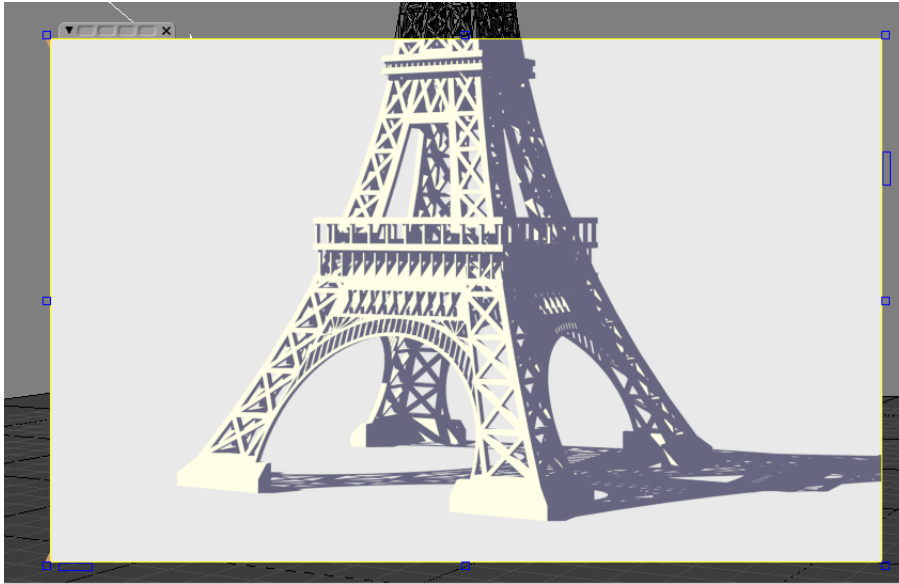
It's better. Now make the light source yellow. To do this, select it, press

Property – SToon – Add SToon Light Property

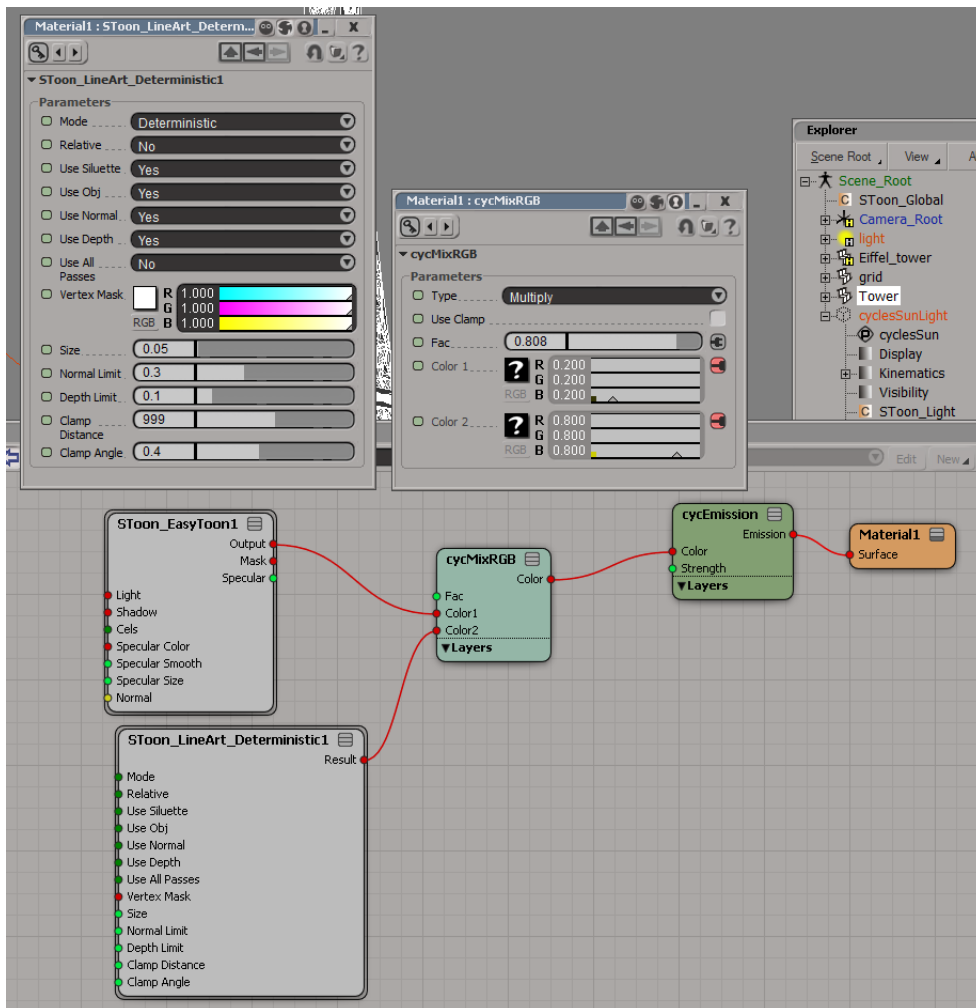
and in the window that appears, set the yellow color for the parameter Light Color.



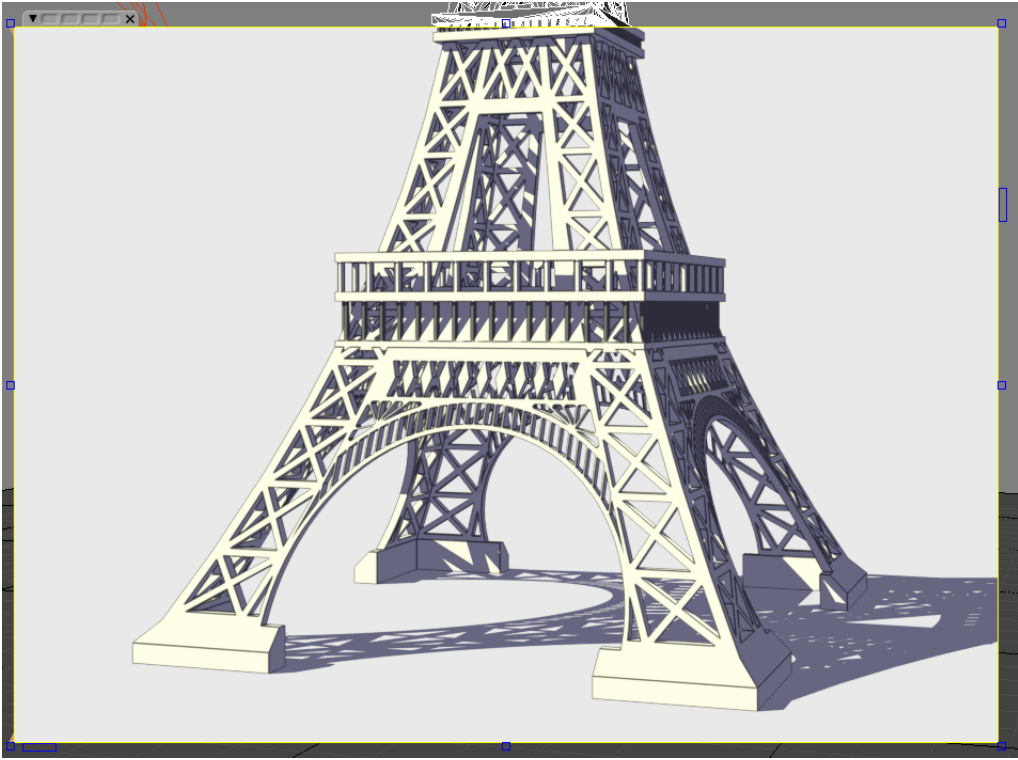
Render.



Finally add the most important element of the cartoon render – the outline strokes. To do this, add a node **SToon LineArt Deterministic** to the tower material. Set the parameter **Size** equal to 0.5, and the parameter **Normal Limit** equal to 0.3. Mix output with the output of the node **SToon EasyToon** with a factor of 0.8.



Render.



2 Using low-level shaders

In general, the universal node for shading is `SToon EasyToon`. However, there are several lower-level nodes from which something more specific can be assembled. Any shading consists of three components: shadows, highlights and actual shading (the color of the object, depending on what is illuminated by the light source and what is not). There are three nodes for shadows

`SToon Directional Shadow`, `SToon Point Shadow` and `SToon Scene Shadow`.

Three nodes for highlights:

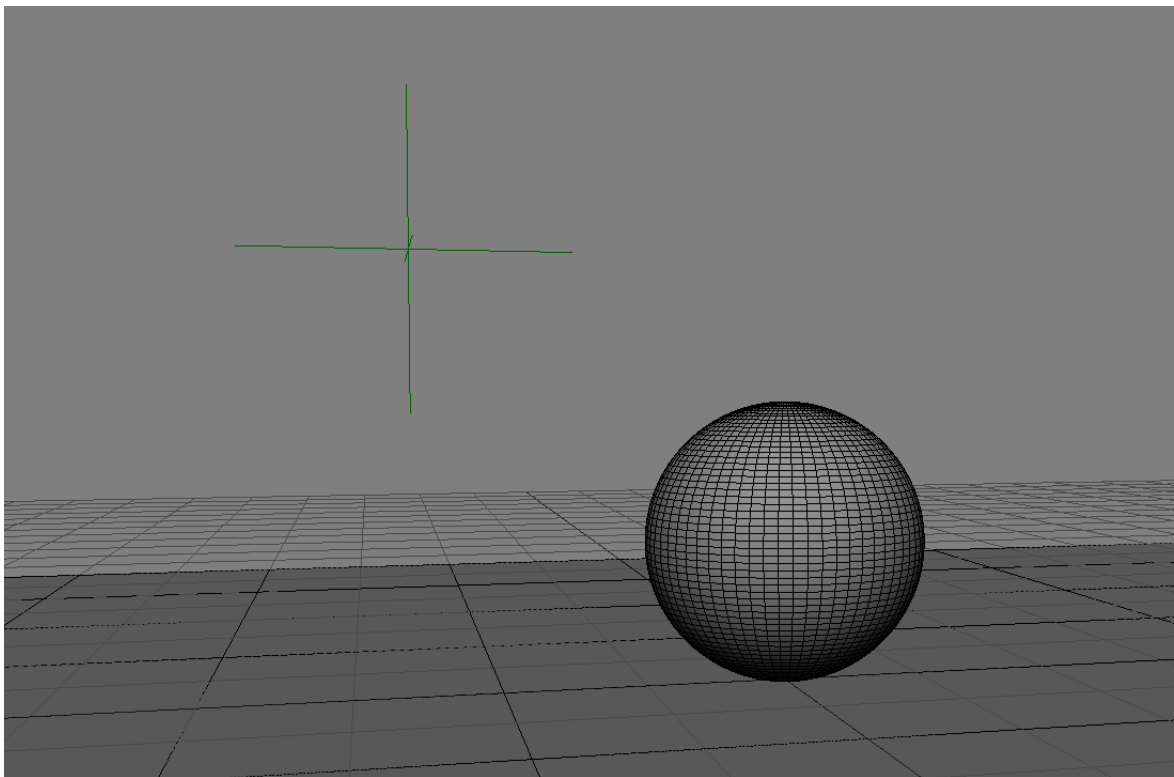
`SToon Directional Specular`, `SToon Point Specular` and `SToon Scene Specular`.

Three nodes for shading:

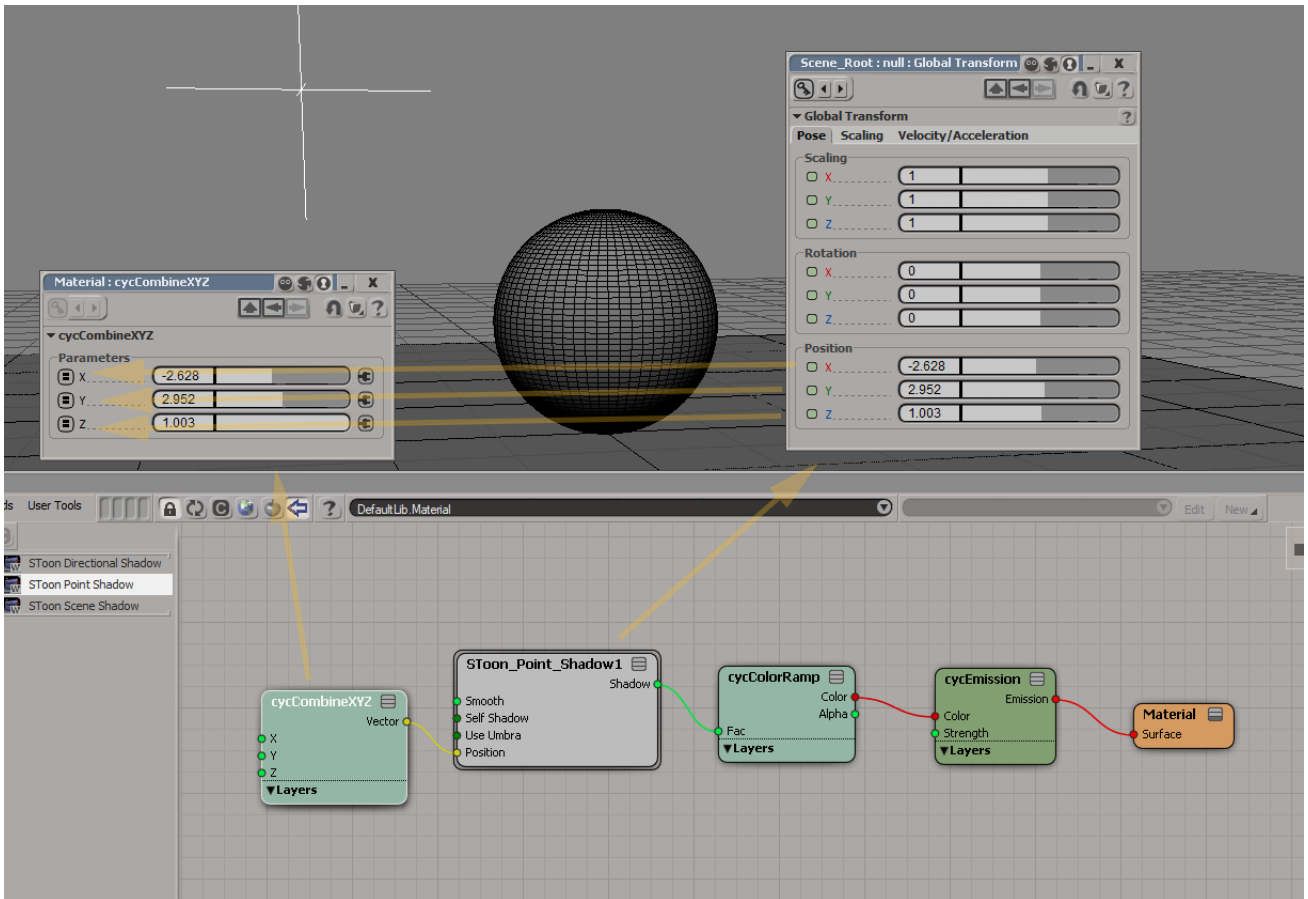
`SToon Directional Shading`, `SToon Point Shading` and `SToon Scene Shading`.

The differences between three nodes in each family is what kind of light sources are used. Nodes whose names contains **Scene** use light sources directly from the scene. These nodes equipped by some kind of data before each frame is rendered. Nodes whose names contains **Point** calculating effects for point light sources, and those in the name of which are **Directional** – for directed lights. Moreover, in the last two cases any object can be light sources, since they only require a position in space. To set the properties of light sources for using in nodes of the type **Scene**, it is necessary to add the `SToon Light` property to each of them. If this property is not present, then the parameters of the light source are considered standard.

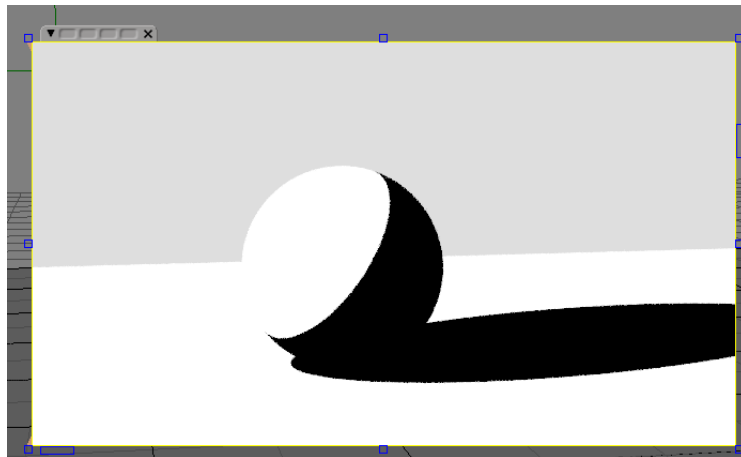
Let's go to practice. Suppose we have a scene with a ball in the plane and one null. This null will a light source.



To the plane and the ball assign a material with a shader `Emission`. Add a node `SToon Point Shadow`. The output is pass through `ColorRamp` and connect to `Color` port of the `Emission` node. To set the source location, we use a node `CombineXYZ`, to the values of which we simply drag the global position of the null.

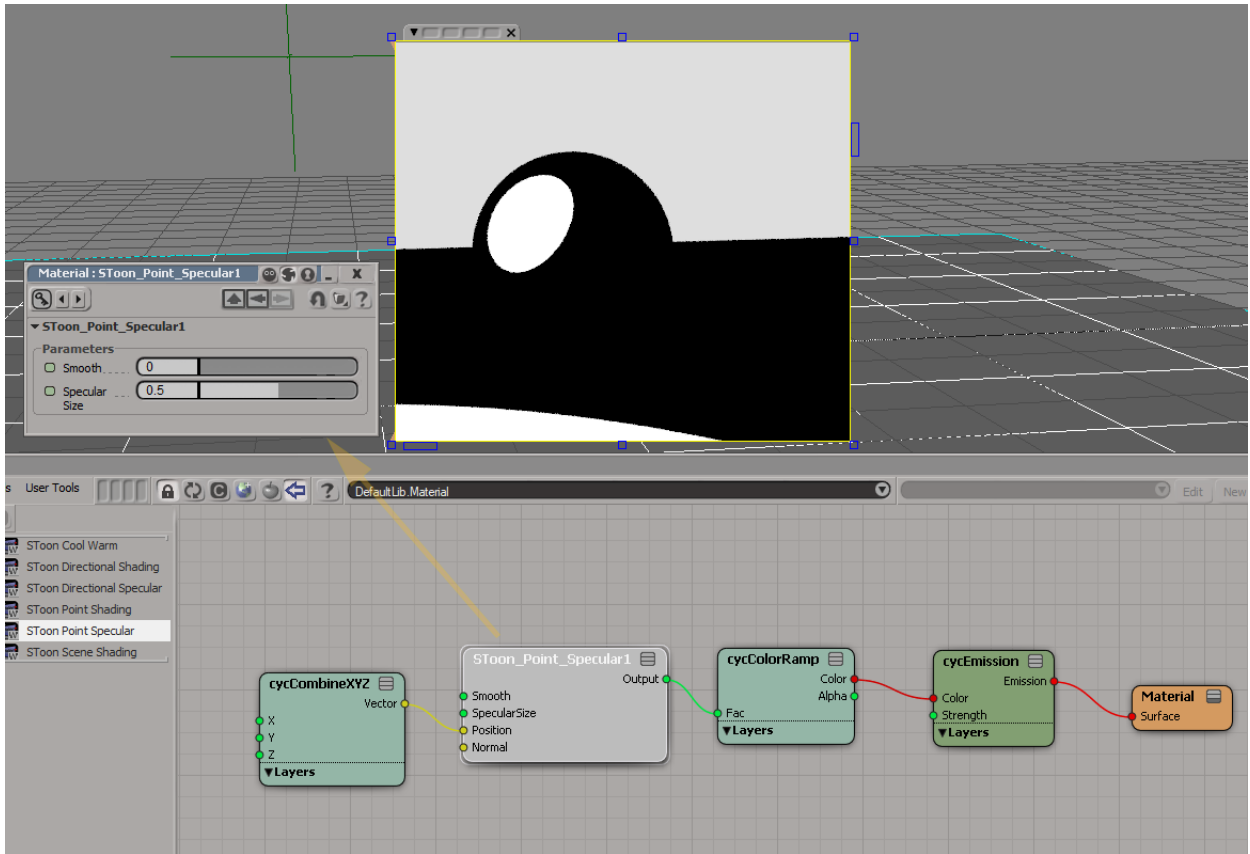


Render and see that shadow zones are black and lighted zones are white.

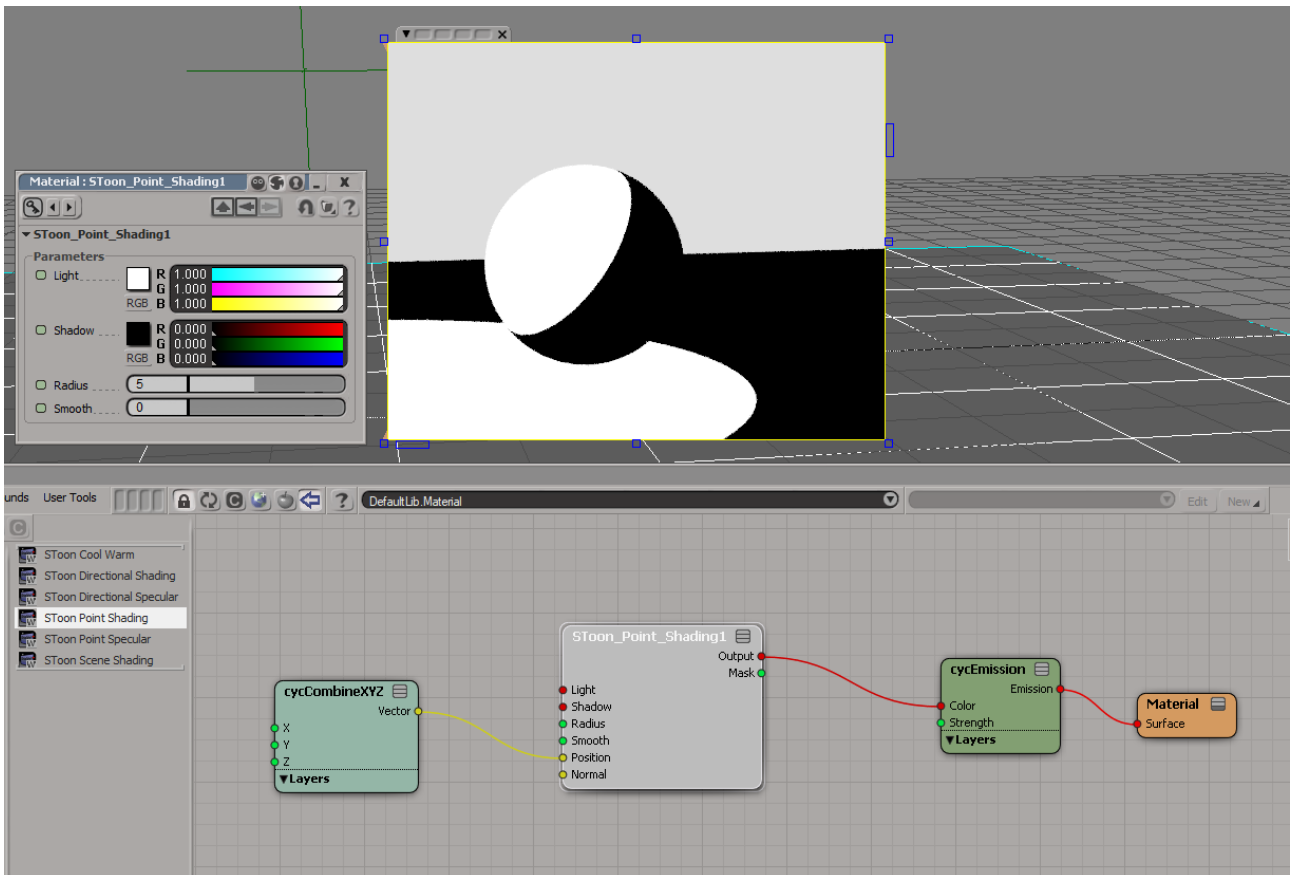


For node **SToon Directional Shadow** the effect is the same. Instead of **Position** parameter it is necessary to set the parameter **Direction**. This parameter is essentially the same location of the light source in space, and its direction is then calculated as the direction to the center of the scene.

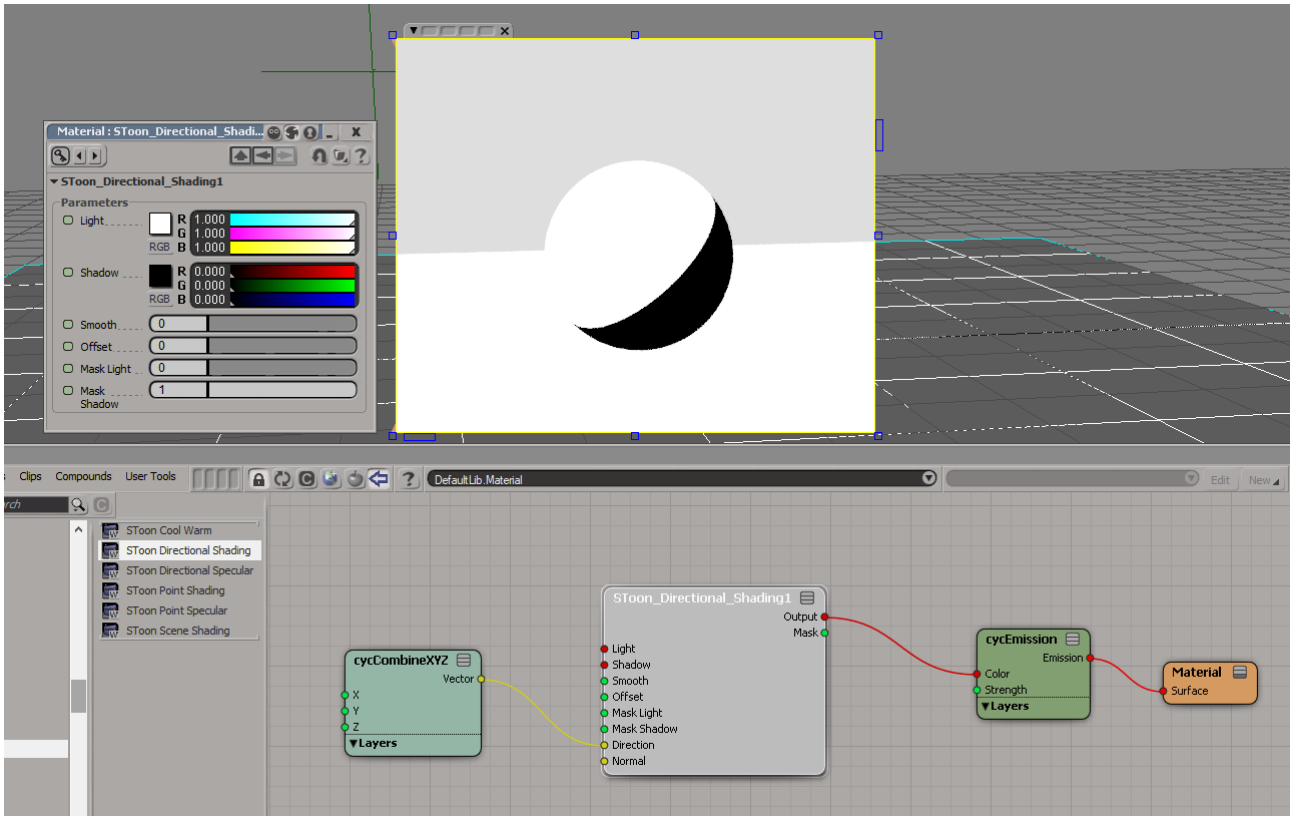
For highlights, add a node **SToon Point Specular**. The result.



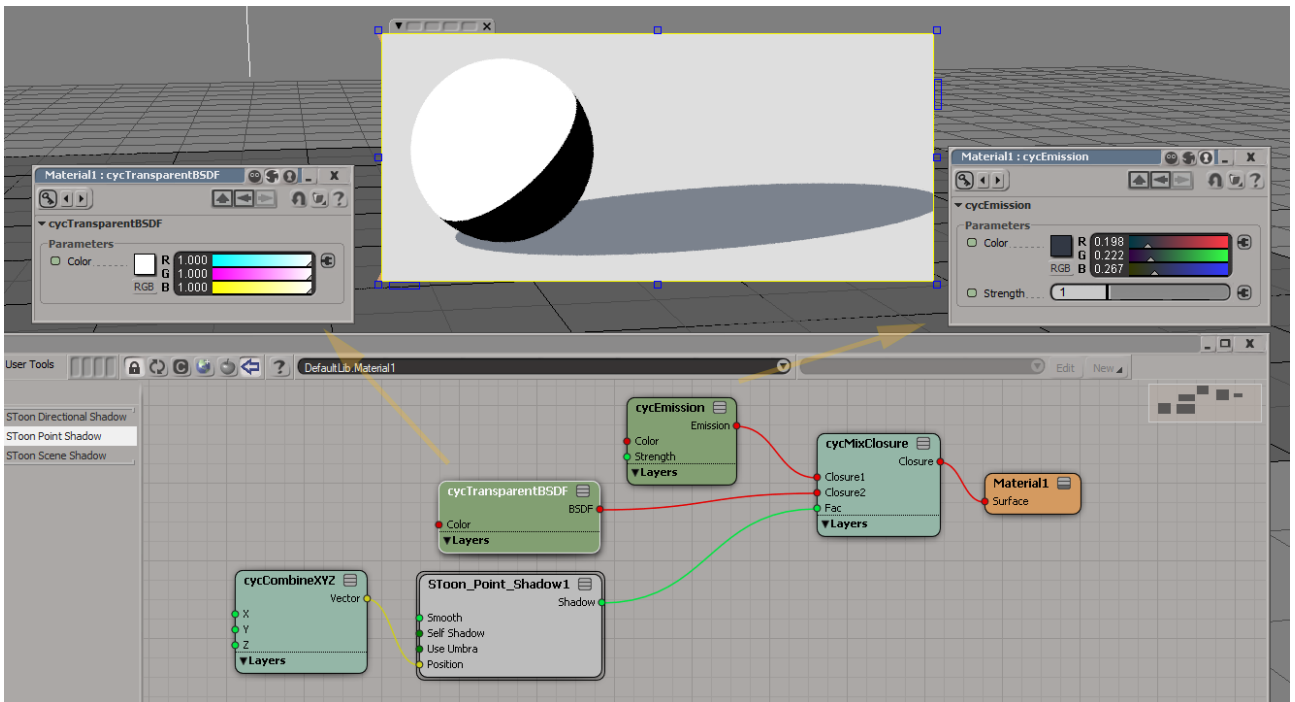
For shading use a node SToon Point Shading.



Parameter Radius of this node determines how far the light travels from the center of the light source. There is no limit of the radius for the node SToon Directional Shading.



Now let's put it all together. First the shadows on the plane. It is simple: draw dark-blue color inside a shadow, and draw nothing by using Transparent in other places.



Next mix highlights and shading on the ball.

