

LA SAPIENZA

FUNDAMENTALS OF COMPUTER GRAPHICS

Homework 4

Author:

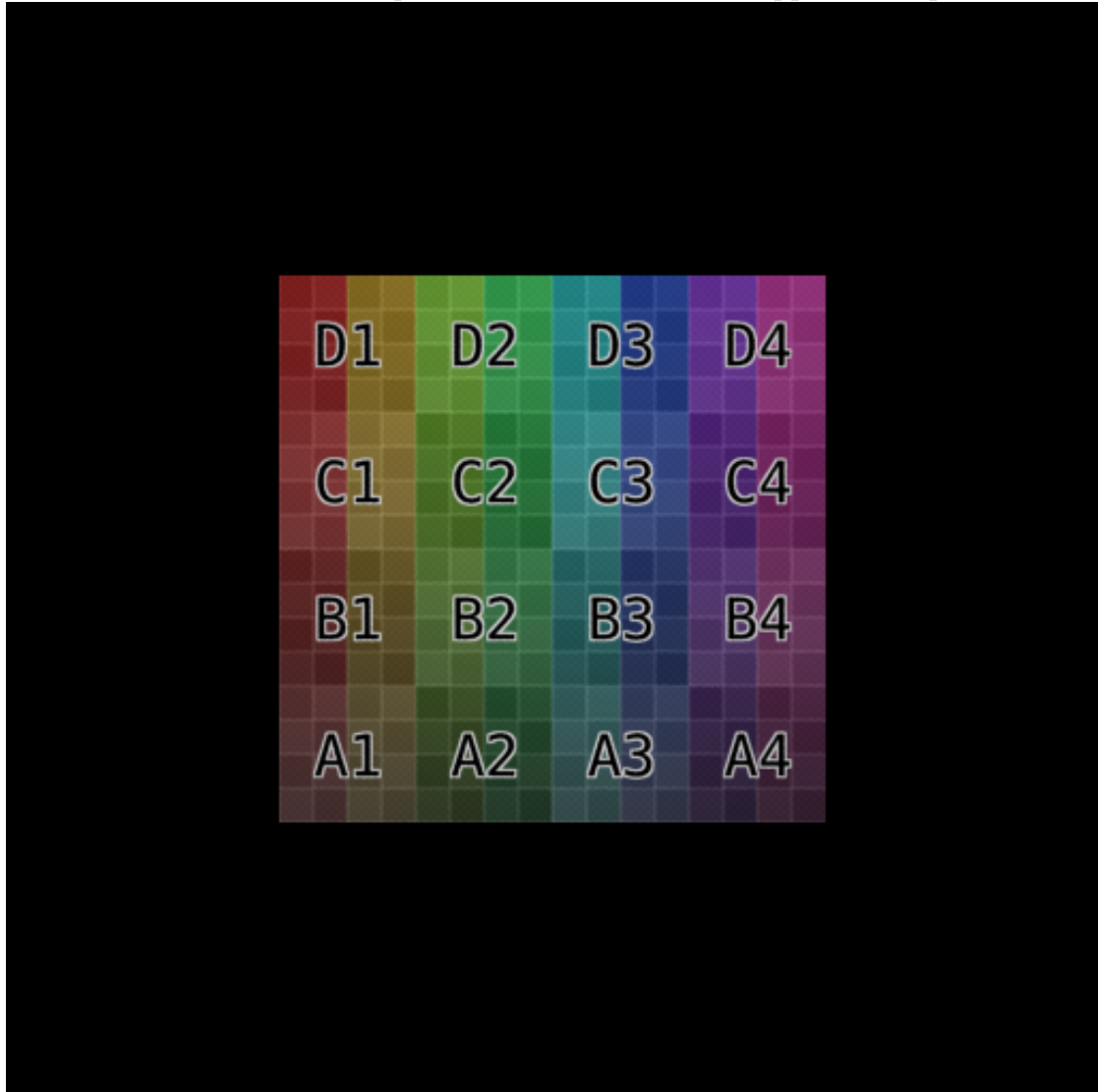
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1 Tests

1.1 Textures

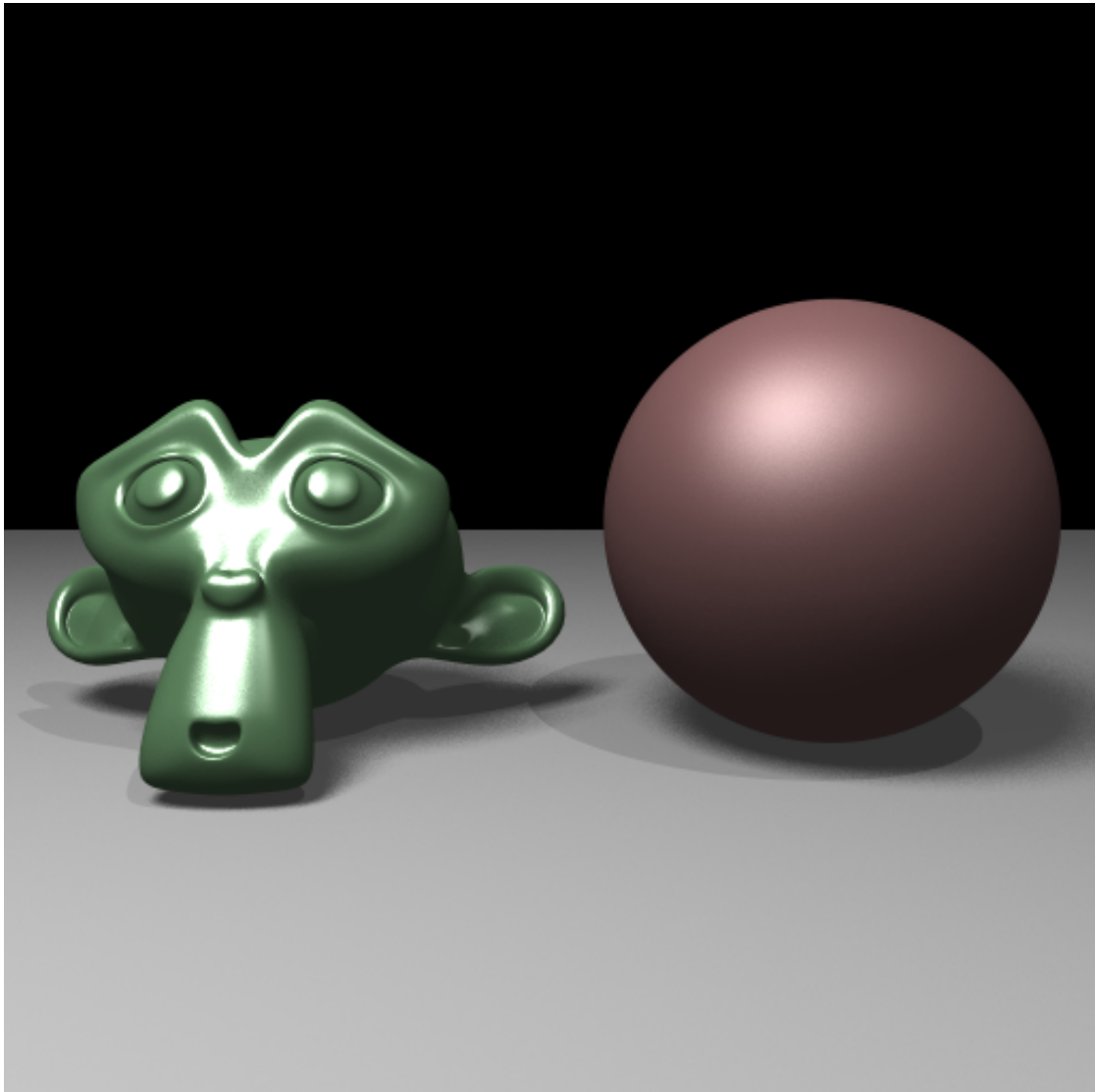
The first test shows an example of how textures can be applied to a plane mesh.



Time: 00:00:01,01

1.2 Area Light

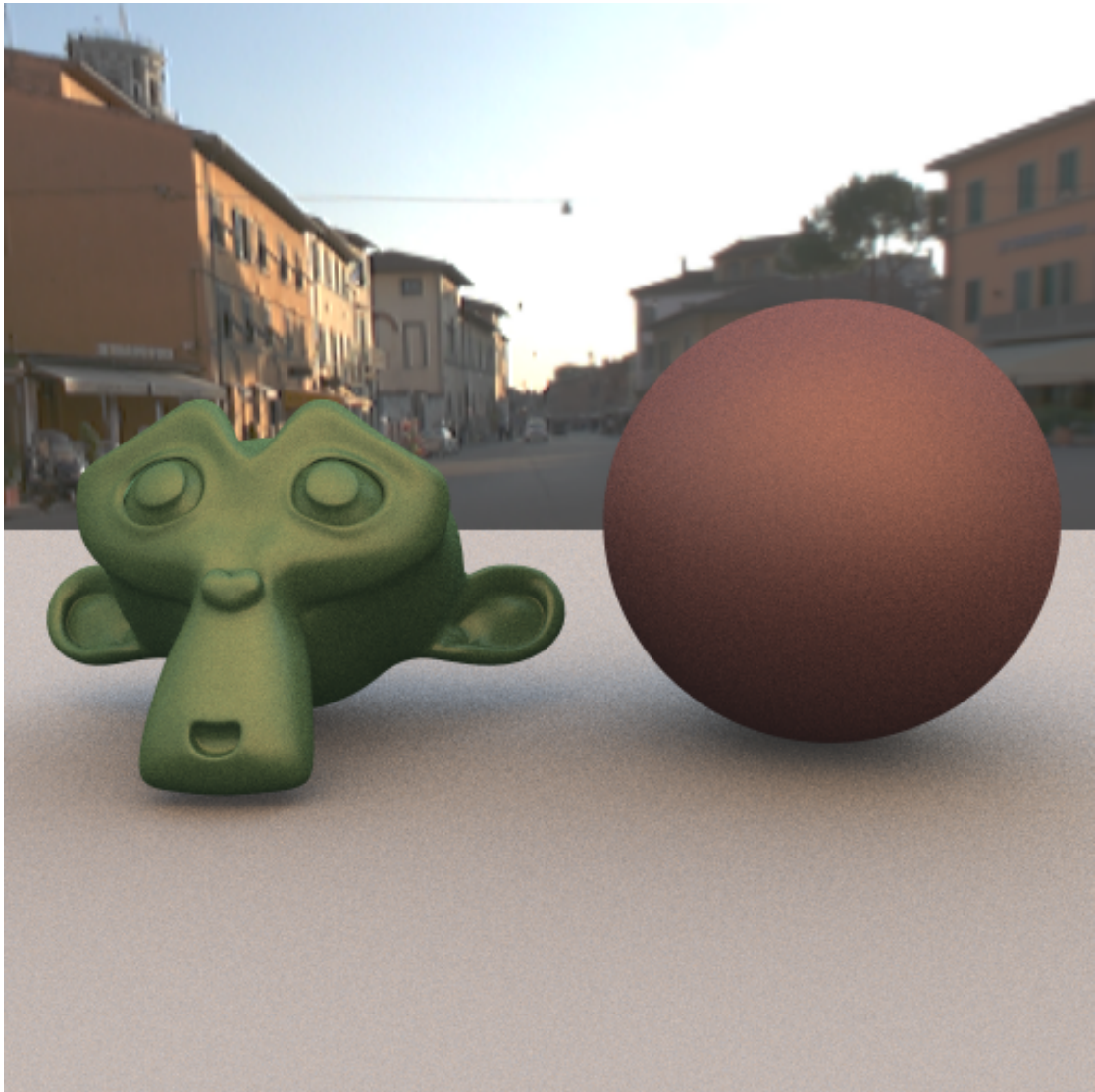
This test shows the effect of an area light (that is positioned behind the camera) on two meshes.



Time: 00:00:35,44

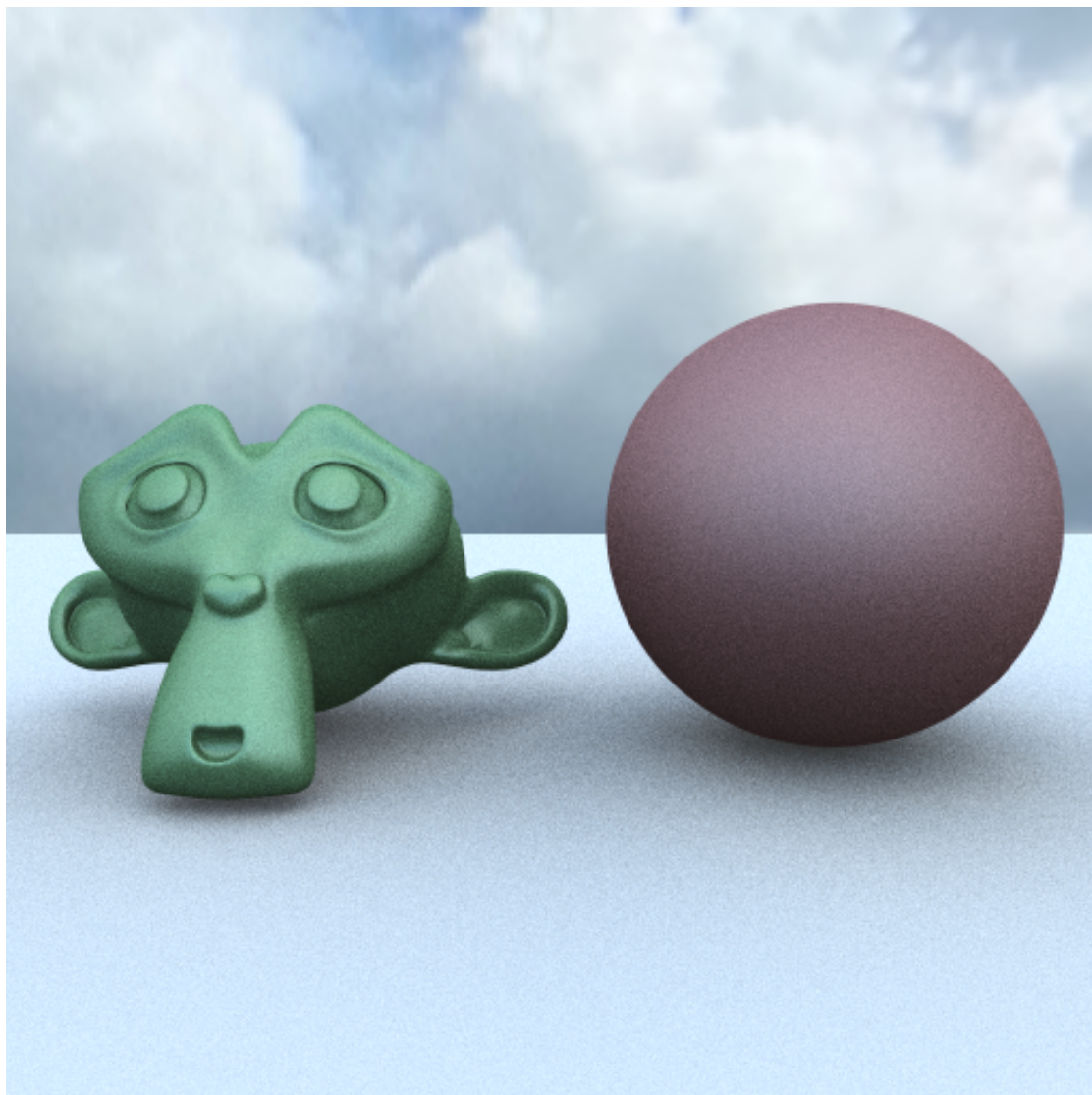
1.3 Environment Light

This test shows the effect of environment light on the same two meshes as before. As opposed to the example before this, here the light we see on the meshes comes from the skybox, assuming the same color as the texture used.



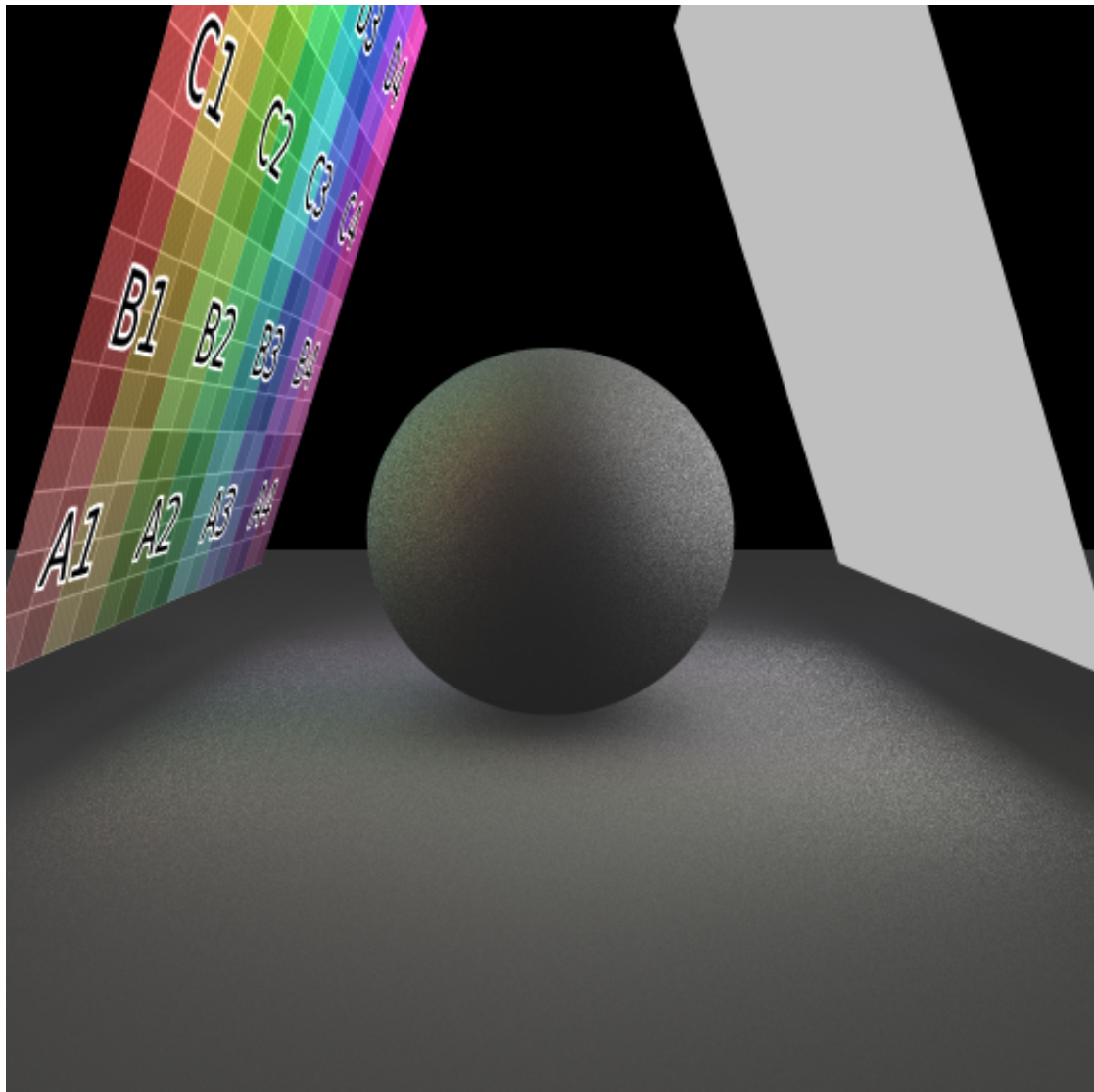
Time: 00:00:35,97

This second image shows the effect of environment light with a different texture.



1.4 Light

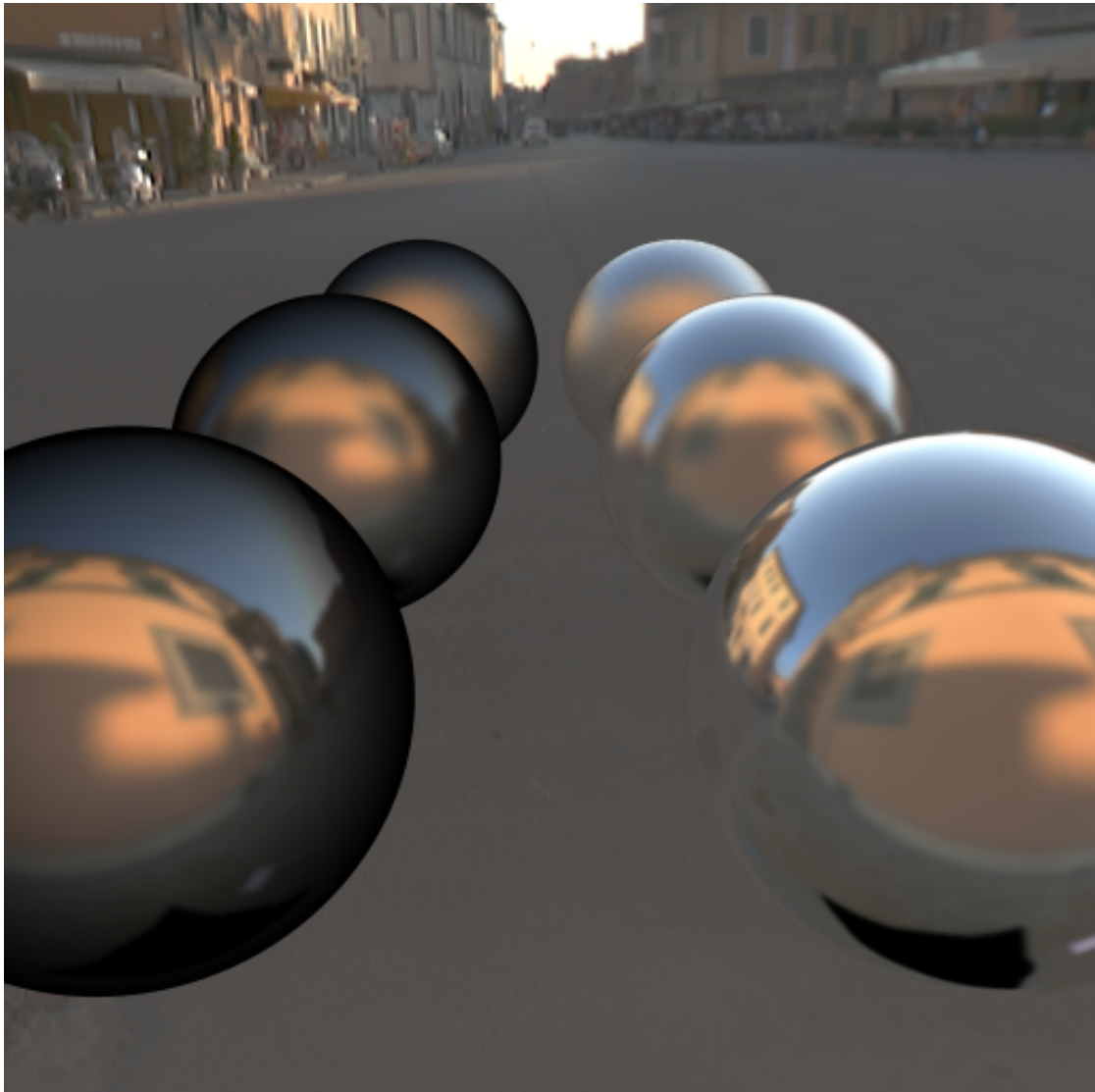
This test shows how light emitted from two planes (one of which is textured) affects the surface of a sphere. The effect of area light can be clearly seen.



Time: 00:00:14,97

1.5 Materials

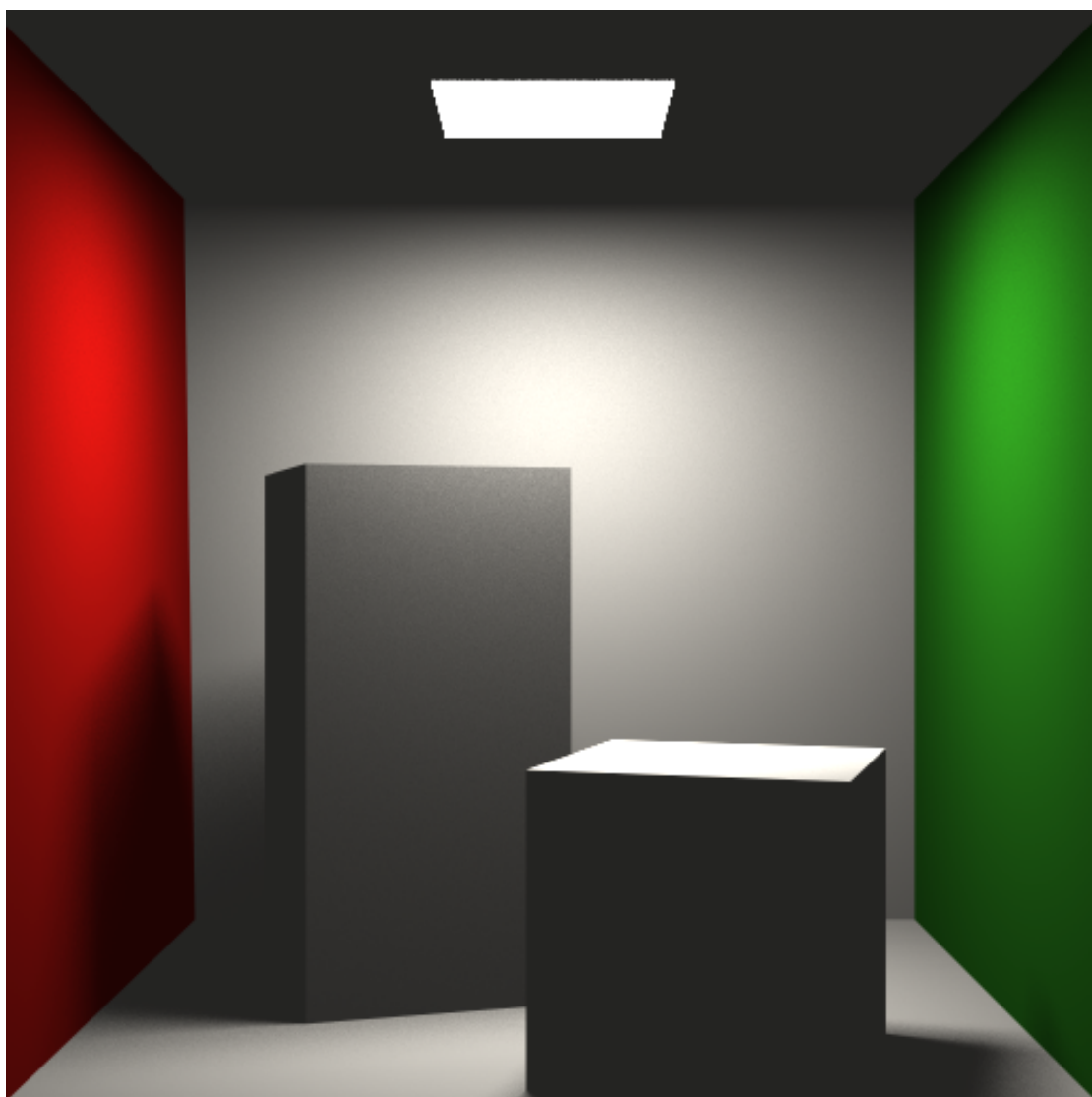
In this test, we show the effect of microfacet on a material. Microfaceting a material means assuming that the surface of said material isn't perfectly smooth, but is composed of many small facets, thus producing a slightly blurred reflection as opposed to a perfectly sharp reflected image.



Time: 00:01:17,77

1.6 Direct Light

Another example of the effect of area light is shown here. Smooth shadows that are obtained with area lights are clearly visible.



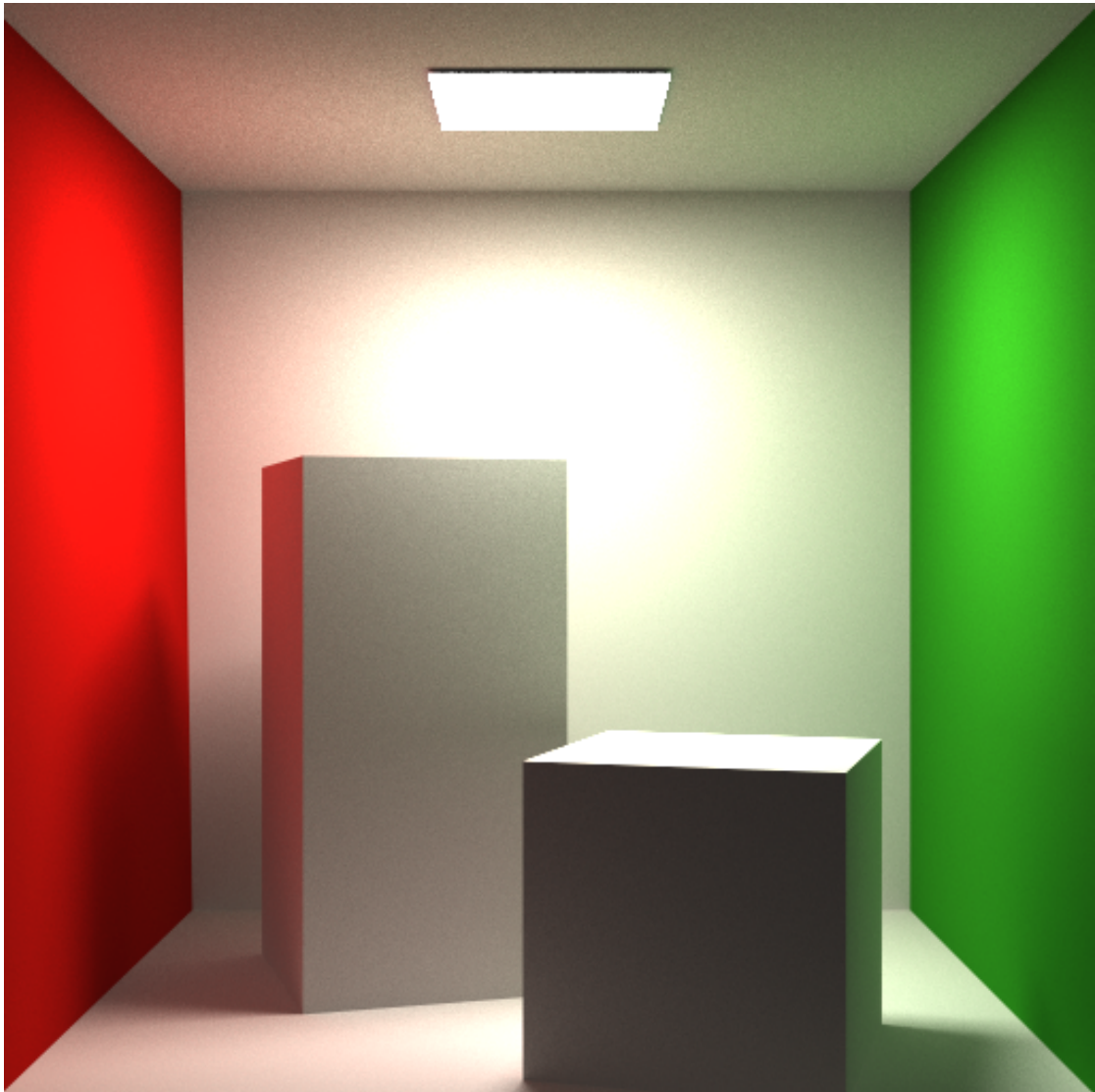
Time: 00:02:34,54

1.7 Indirect Light

Here we can see the effect of indirect light. The difference with the example before this is that here we also consider the fact that surfaces not only absorb but also reflect a part of the light that hits them.

In the image, a red light comes from the left and a green one from the right, but there are no added lights from the example before. This is just the effect of reflected lights on the two colored walls.

The effect is obtained by recursively calculating the pathtrace result, each time recalculating the ray direction and origin.



Time: 00:07:28,99

1.8 Custom

This last one shows many of the features of the tests before in a single image. The macbook is composed by different materials, each one with its own properties: spacing

- The body is made of a microfaceted, specular material.
- The keyboard instead needed to be dull, therefore is not specular at all, and has a texture with the key symbols.

- The screen is emissive and has an emissive texture, so it emits a colored light.
- Other small components are dull as well.

The image also features indirect light and an area light positioned behind the camera.



Time: 00:53:22,03