

Tutorial 2 - Introduction to Blender and PBRT

Computer Graphics

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Part 1: *Building a scene with Blender*

Blender is 'free and open-source 3D computer graphics software toolset used for creating animated films, visual effects, art, 3D printed models, motion graphics, interactive 3D applications, and computer games. Blender's features include 3D modeling, UV unwrapping, texturing, raster graphics editing, rigging and skinning, fluid and smoke simulation, particle simulation, soft body simulation, sculpting, animating, match moving, rendering, motion graphics, video editing, and compositing'. As you can see Blender is capable of many things - it is easy to start working with, but difficult to master.

You can use Blender to create a 3D scene, with different objects, textures, etc., export the scene and use PBRT for rendering. Of course, you can use Blender's rendering engine as you develop the scene, but PBRT will give you more options for the final rendering. In this tutorial, you can find detailed intructions of how to apply texture and displacement mapping to on object.

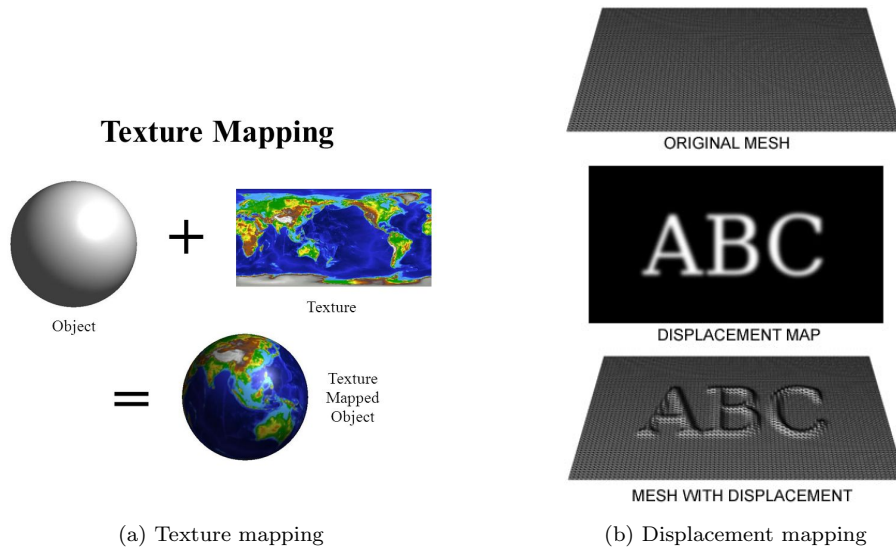


Figure 1: Texture and displacement mapping

Part 2: *Rendering with PBRT*

Make sure you go through the documentation of installing and building pbprt. I would suggest the following workflow:

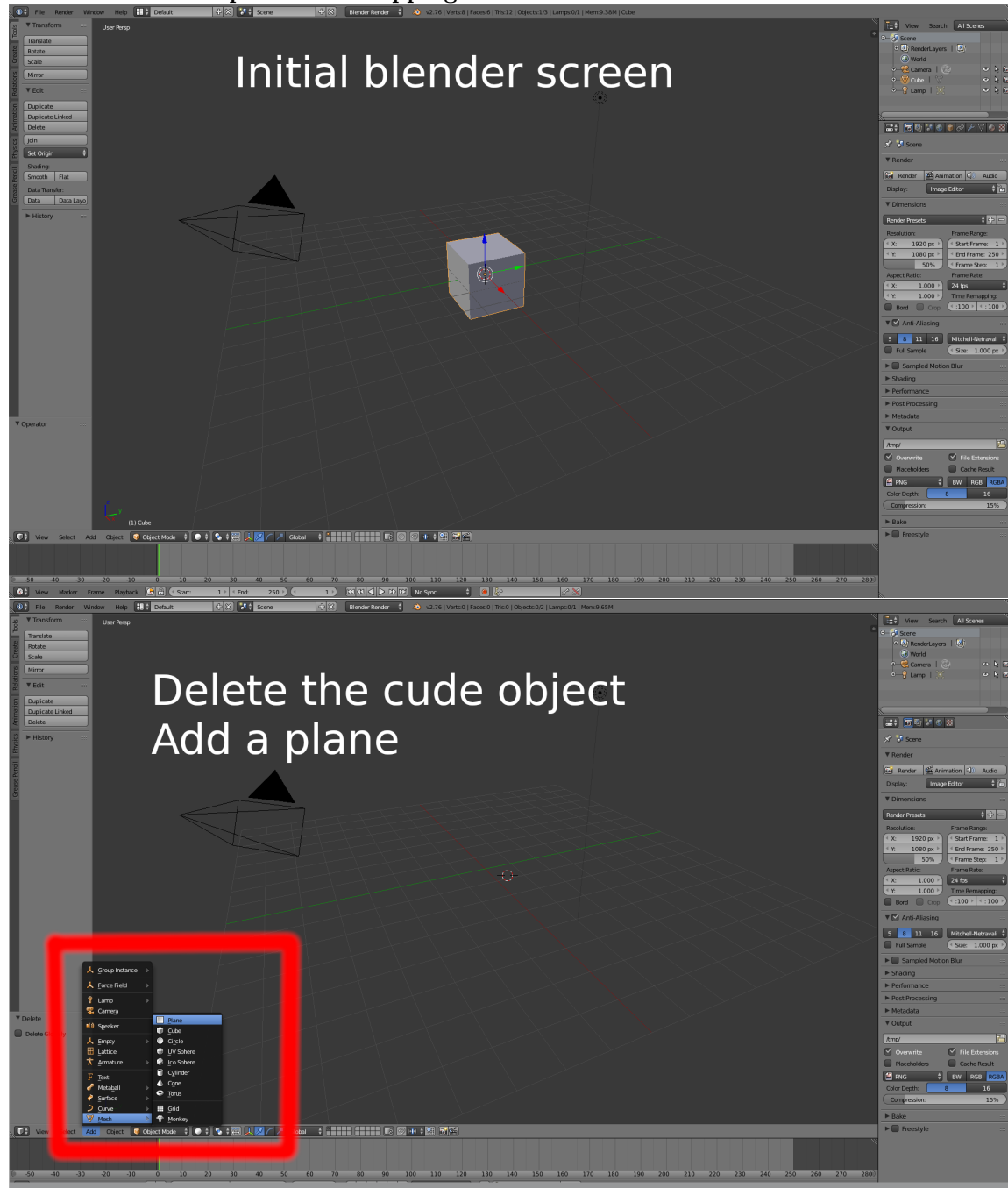
1. Install pbrt
2. Render the default scene provided with pbrt, Rendering with PBRT
3. Explore the default .pbrt file - How do you specify the camera position?, how do you define the source of light?
4. Install pbrt exporter in Blender, (screenshot instructions available at the last two page of this document as well)
5. Alternatively you can export the scene from Blender in an .obj format and use obj2pbrt from pbrt (information available here [Rendering with PBRT](#))

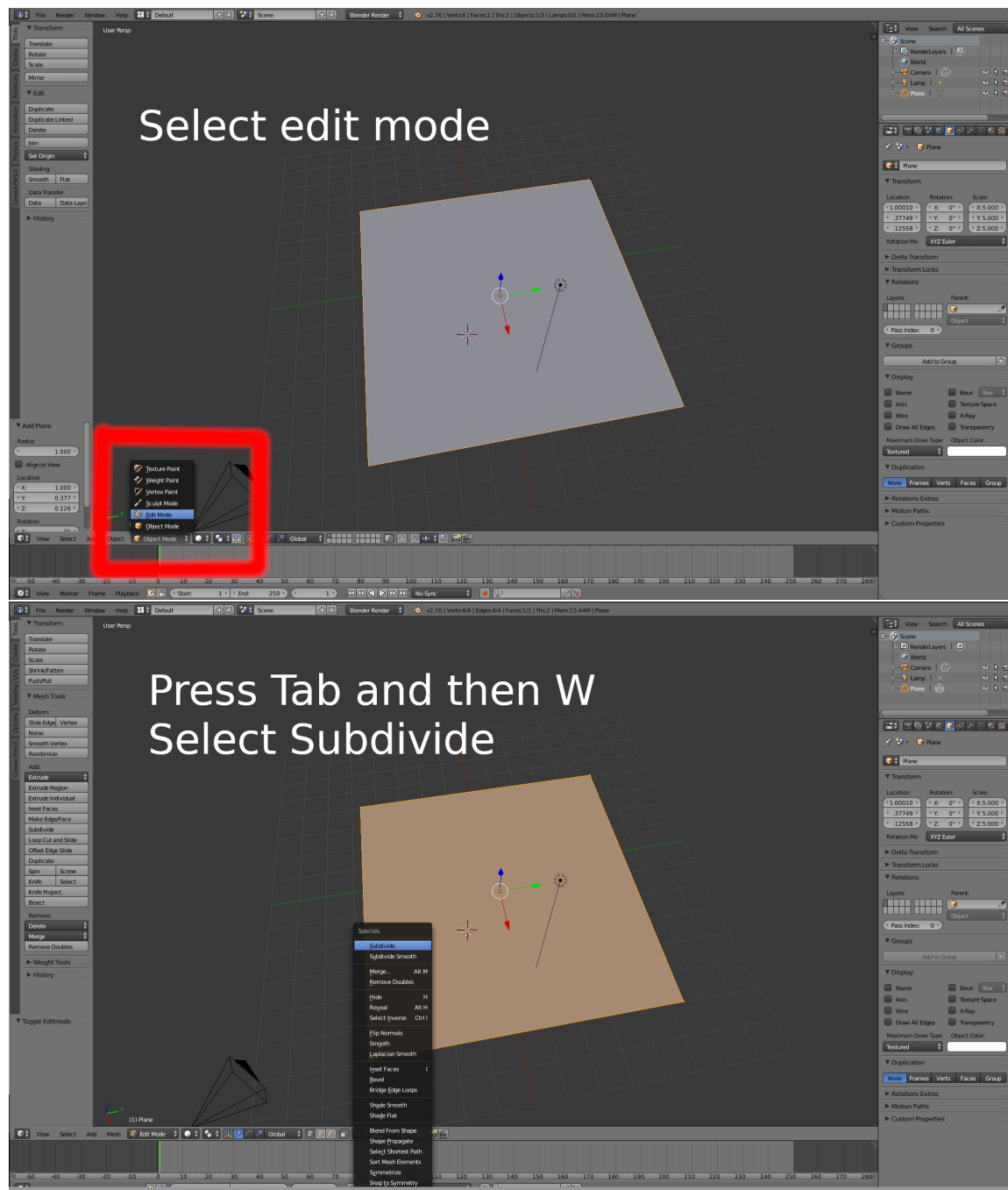
Going through the list, should give you an idea of pbrt and how you can use it. You will probably spend most of your time in Blender, designing the scene. After you are done, you can export the scene and render it with pbrt.

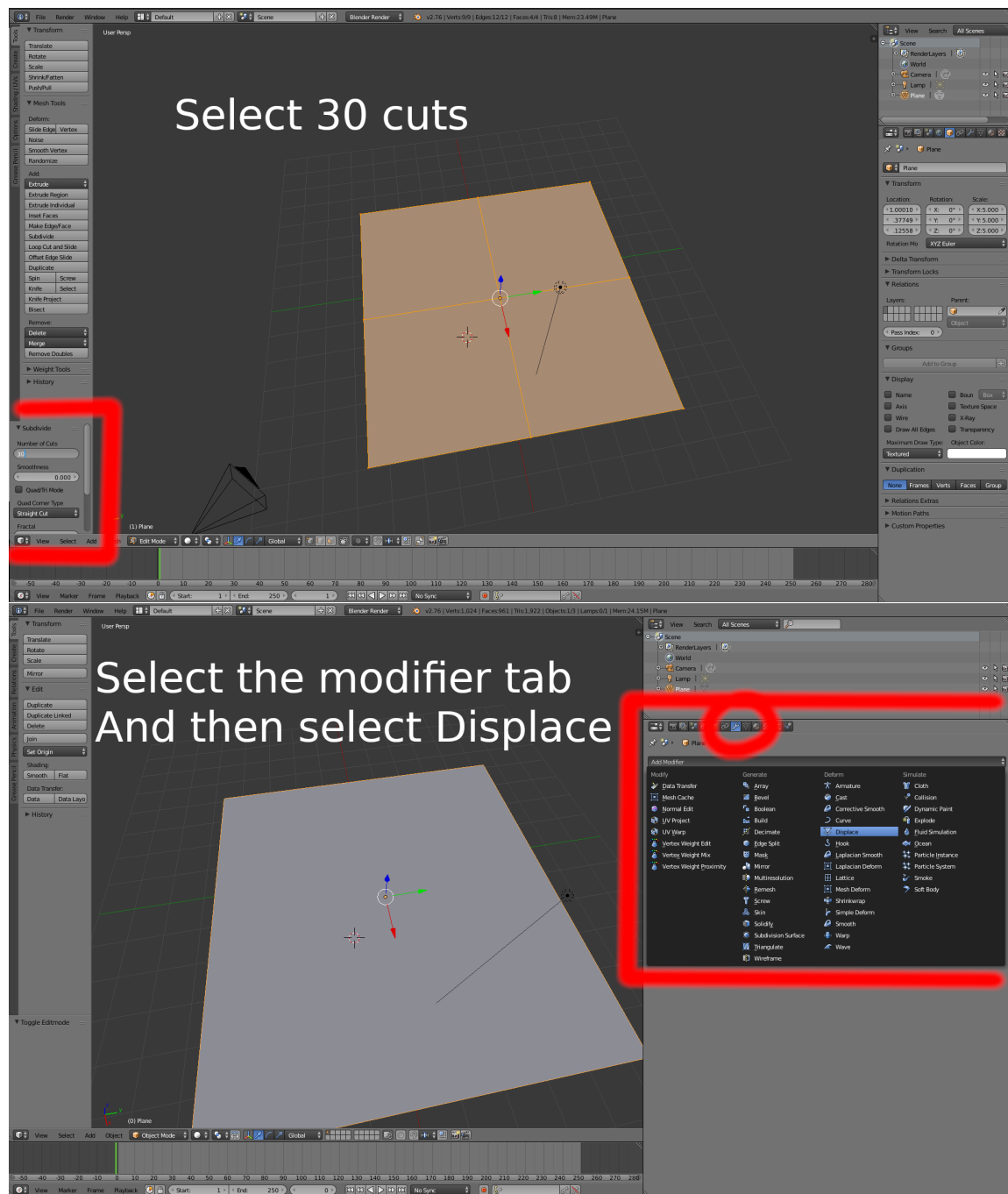
Part 3: *Get creative!*

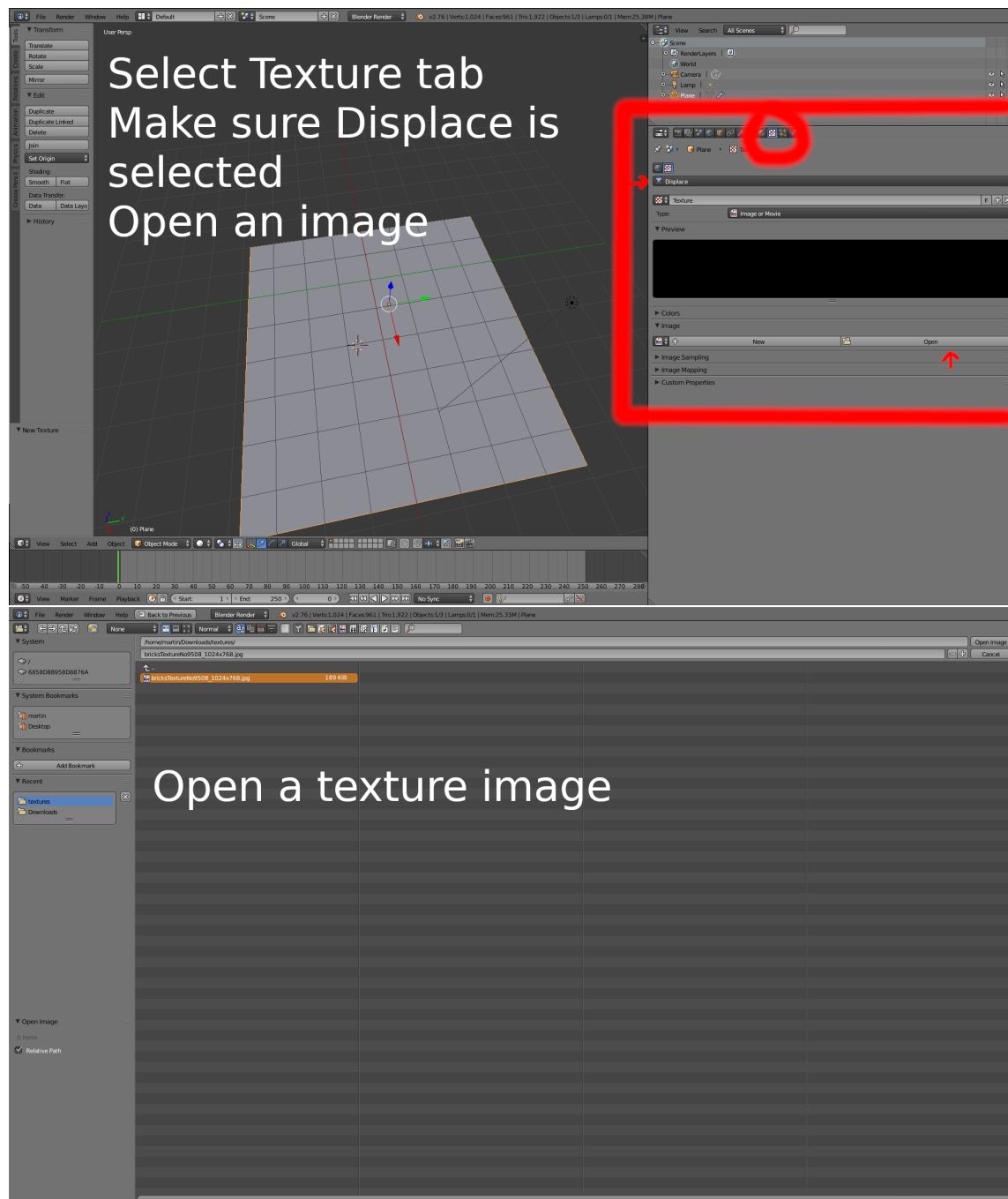
Generate your own scene with custom objects with texture and displacement mapping. To generate a realistic image you have to find the right combinations of object placement, lighting, materials, and the here defined textures and displacement. You can use the default options in blender for textures and displacement maps or search for images on the Internet that you can use. Can you generate your own texture maps? You can find a C++ library and some of the results [here](#). Try to implement a procedural generated texture using OpenCV and C++, you can find an example of how you might go about this [here](#) (the example is in Python, but you can follow the logic).

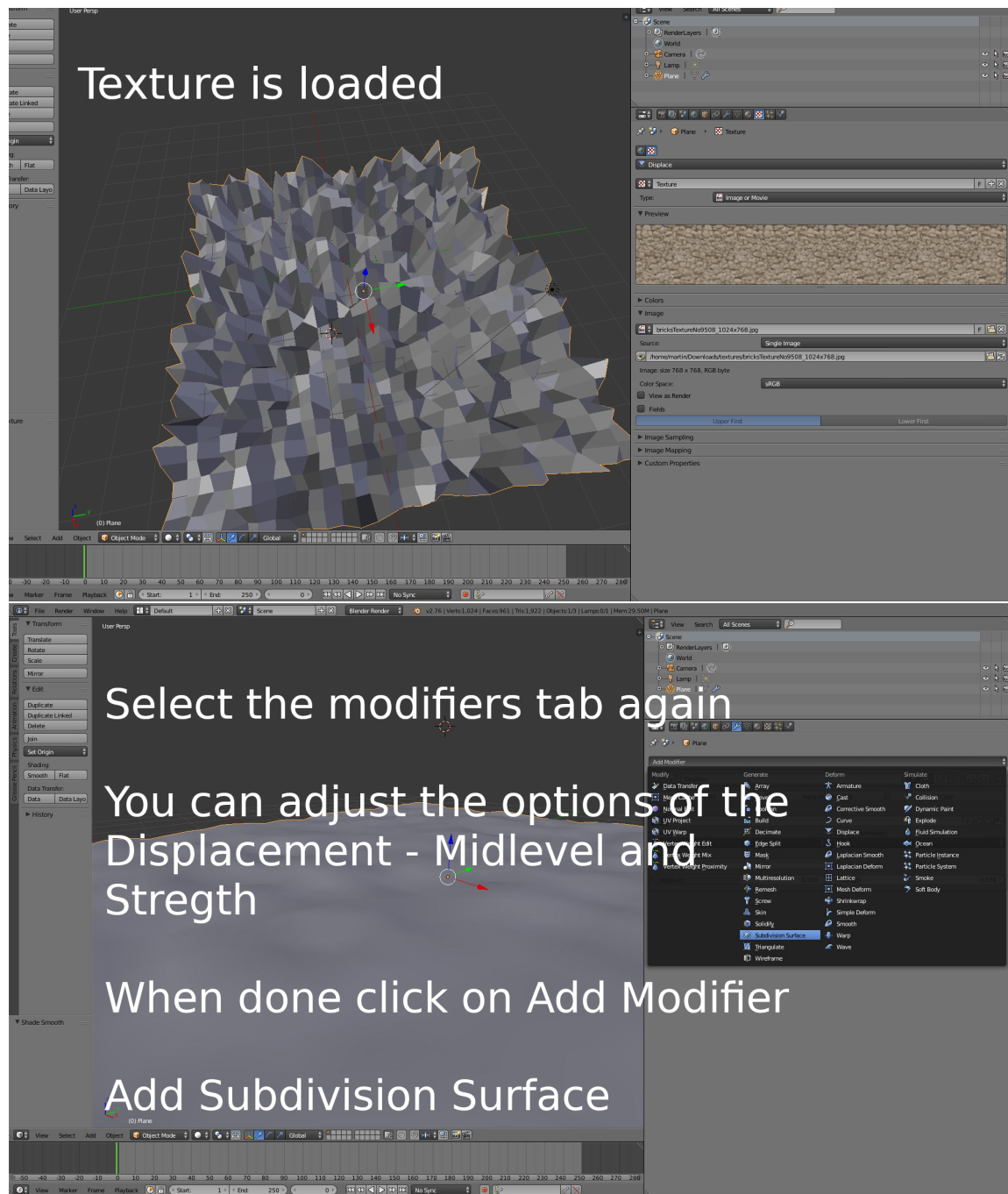
Texture and displacement mapping in Blender

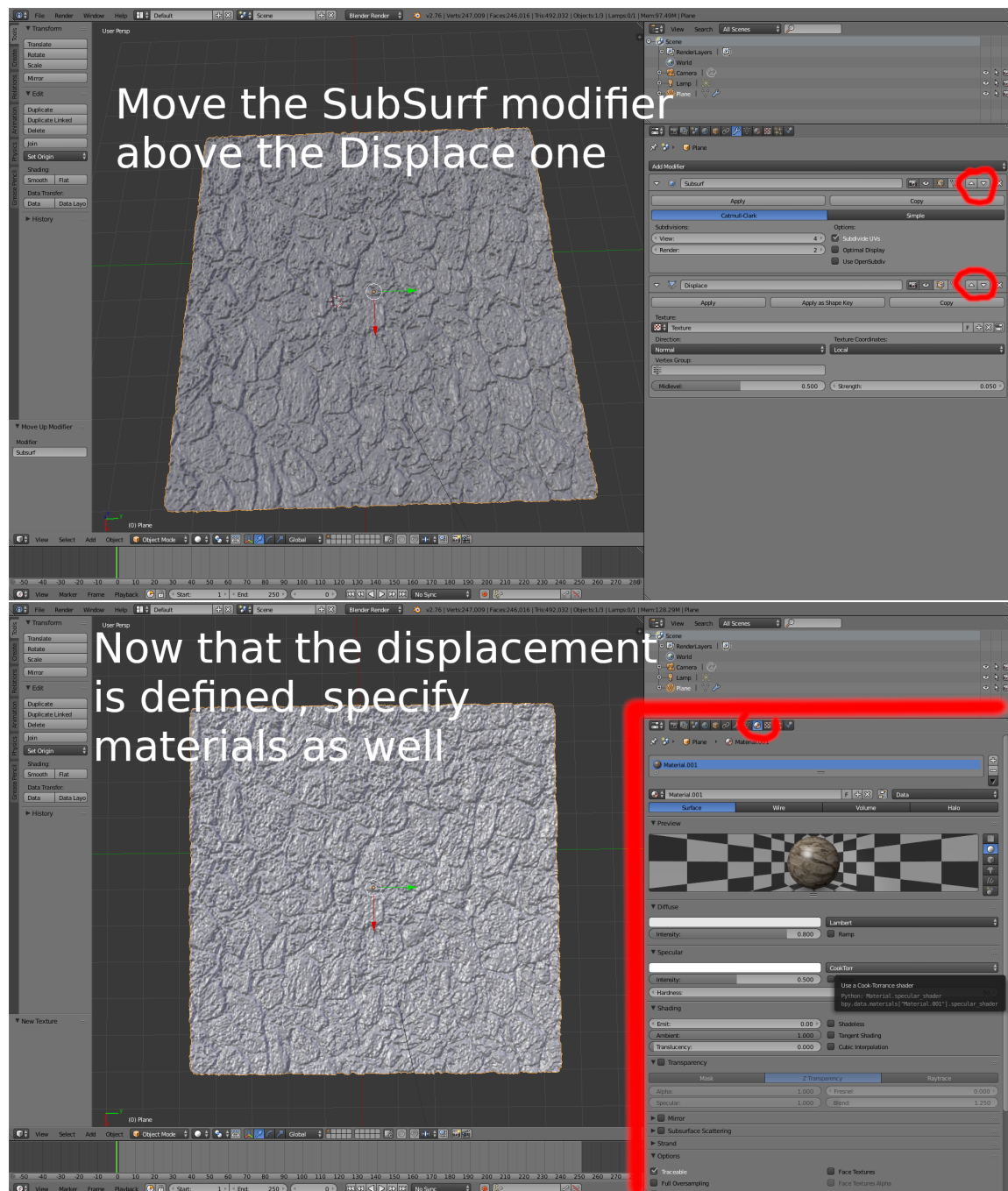


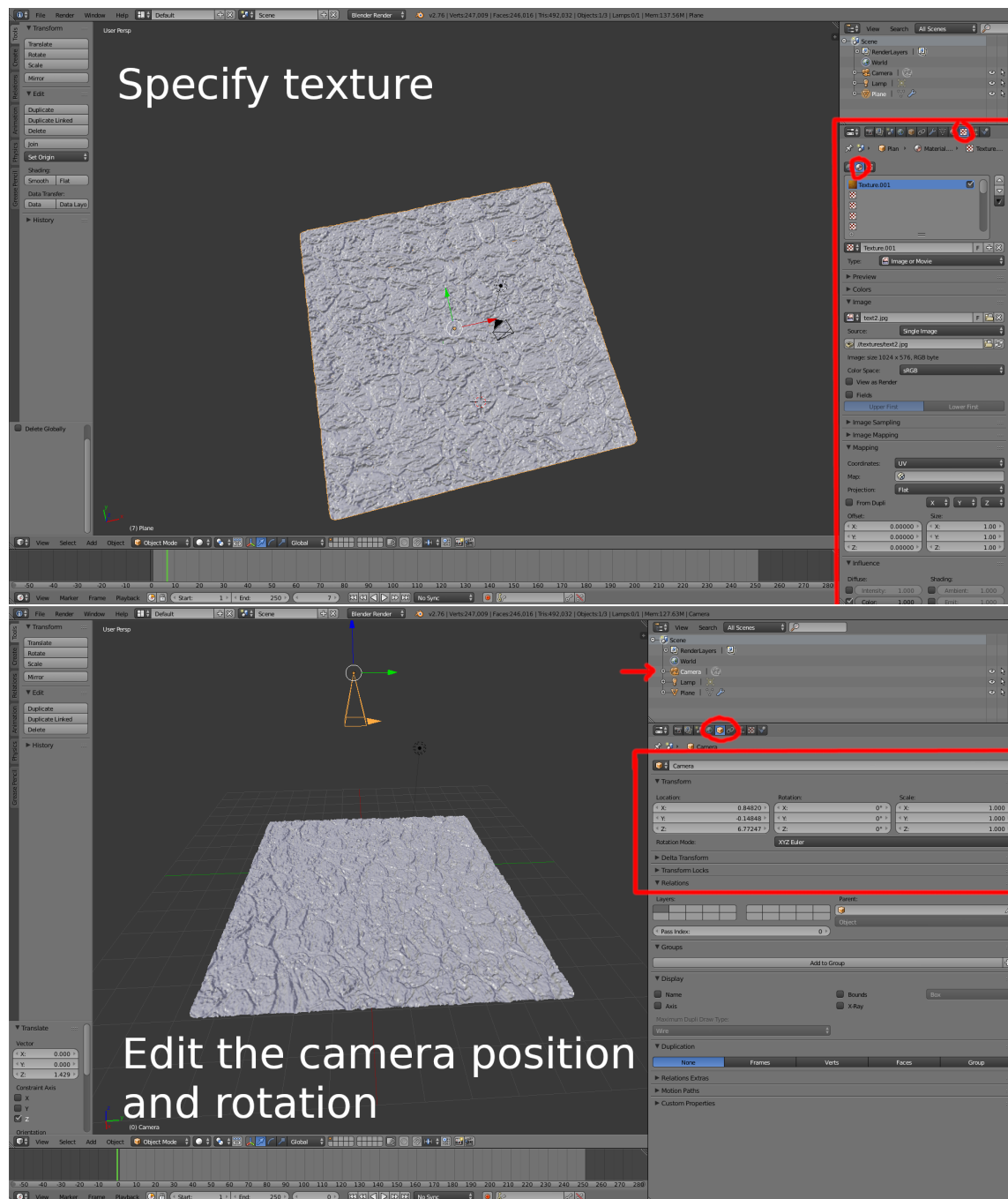


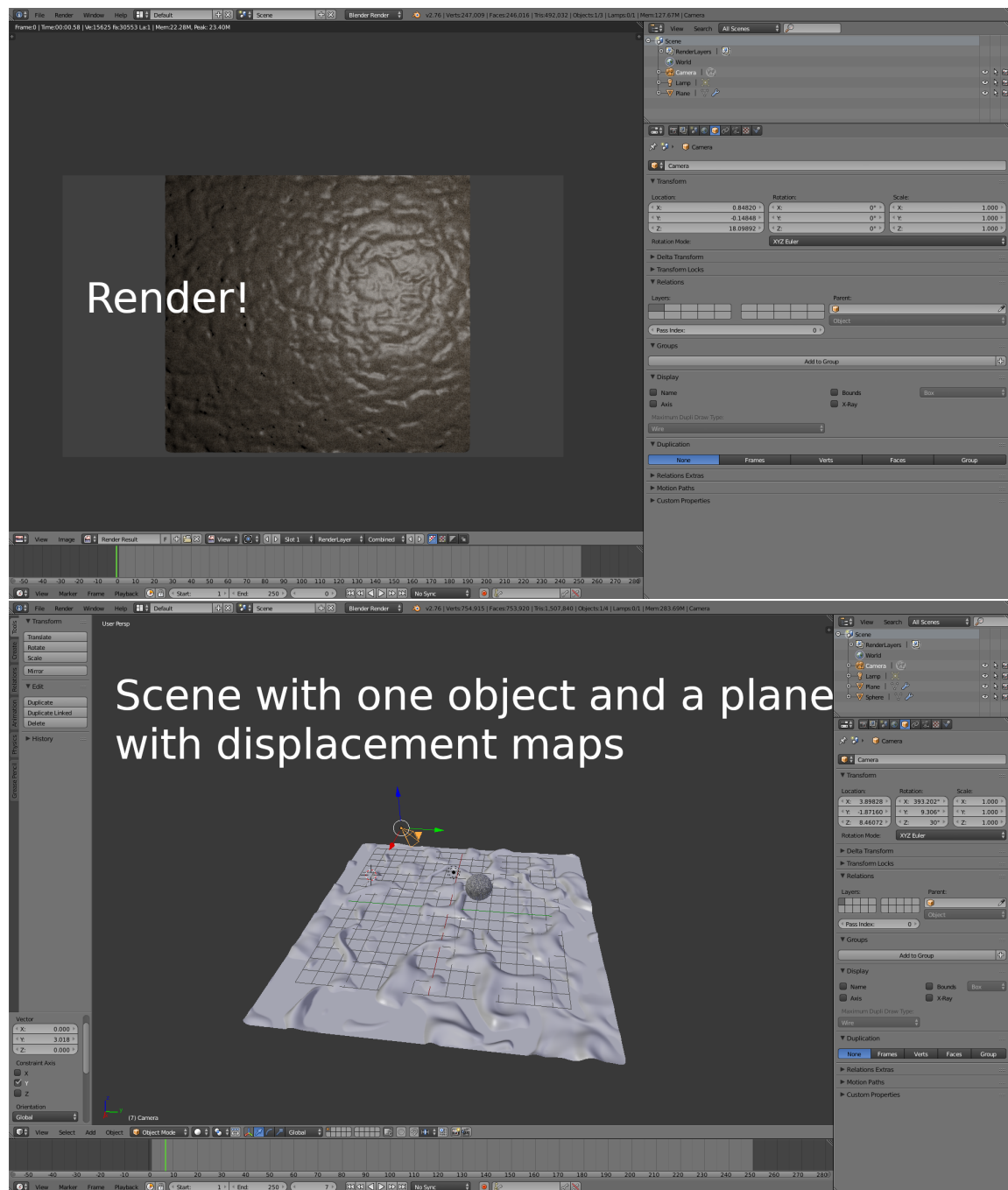


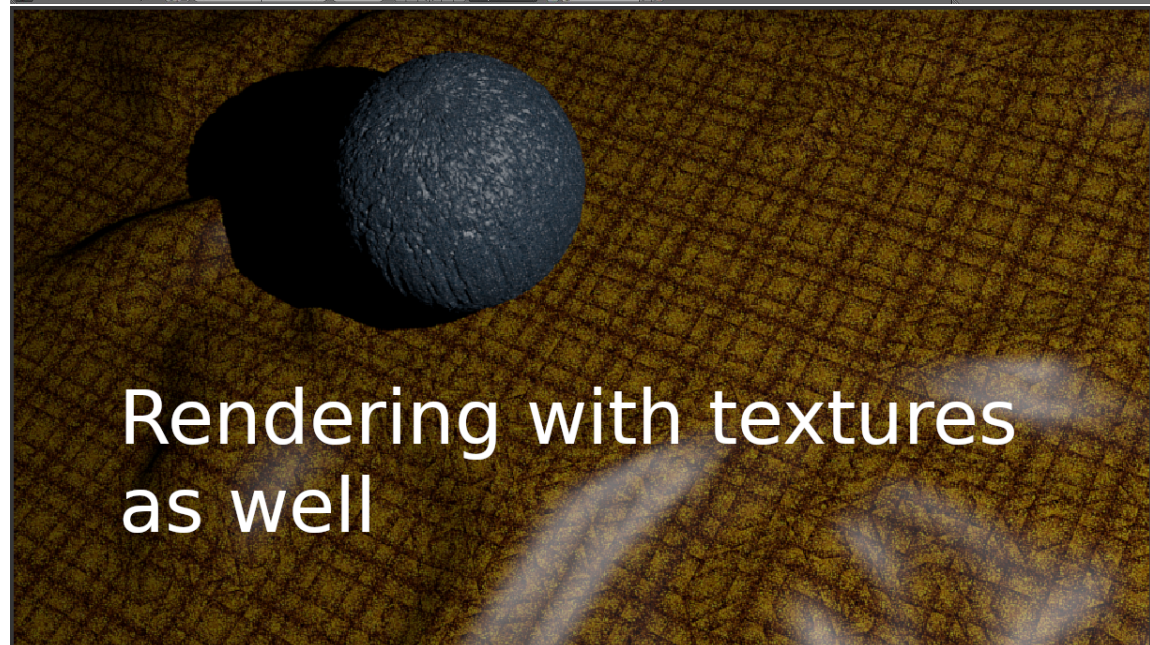
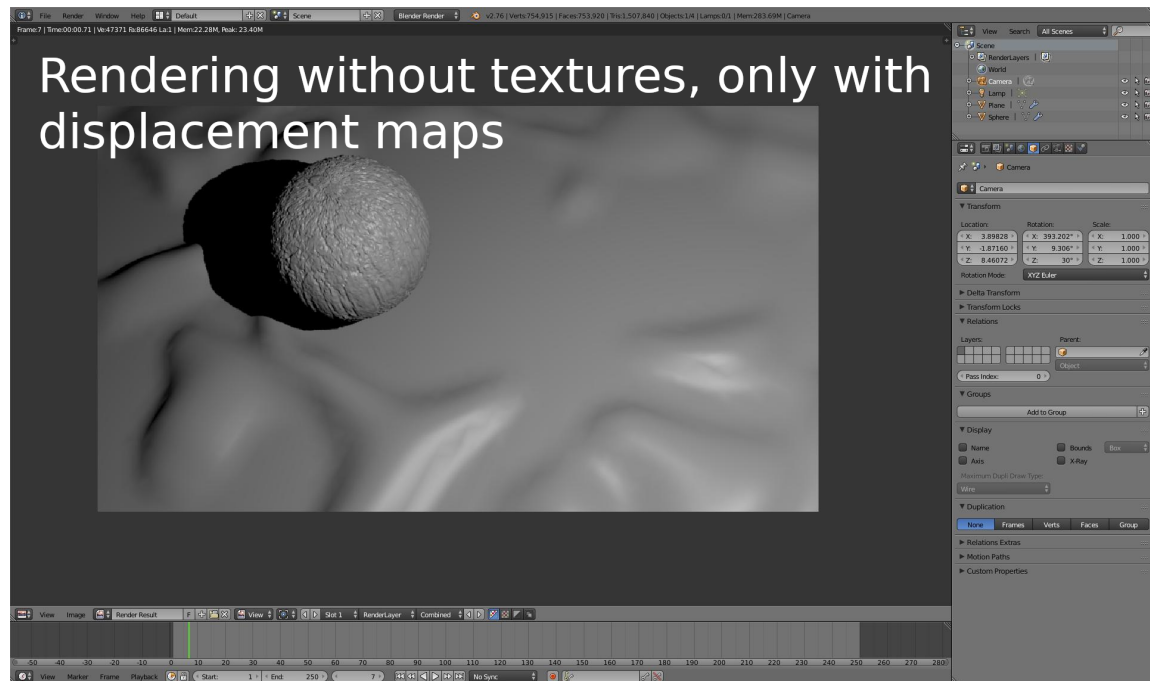












PBRT support in Blender

