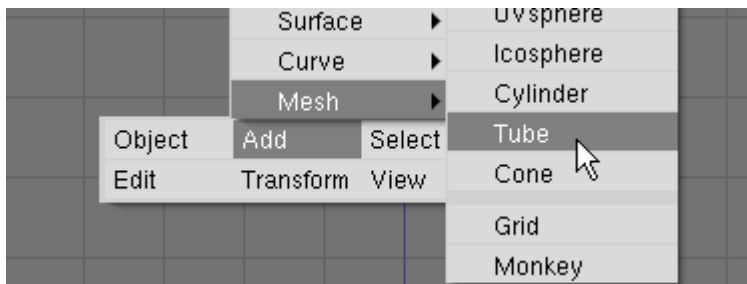


Course: 3D Design  
Title: Deformation Modeling: Cave  
Dropbox File: Cave.zip  
Blender: Version 2.41  
Level: Beginning  
Author: Neal Hirsig ([nhirsig@tufts.edu](mailto:nhirsig@tufts.edu))

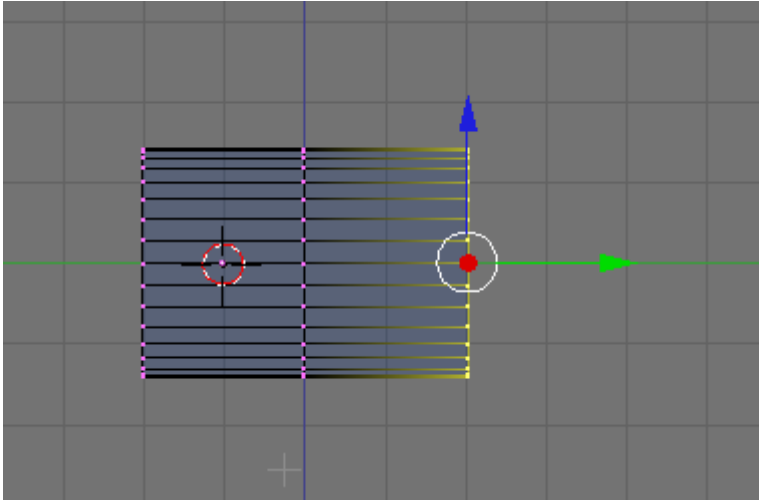
## Deformation Modeling – Cave



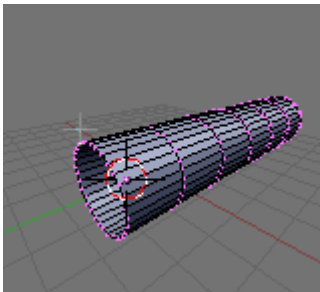
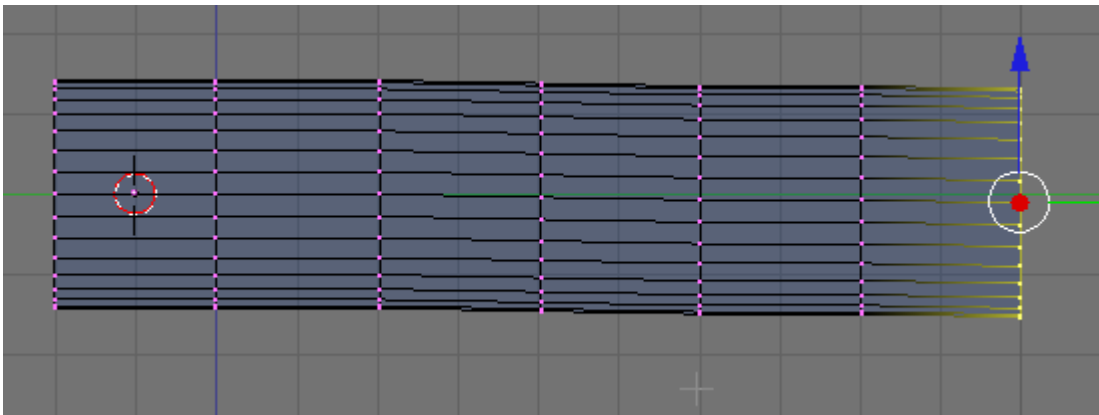
Open MyBlender.blend (or the default if you are using MyBlender as the default Blender file). Select the default cube and delete it. **Switch to Front View**. Place your 3D cursor at the center of the viewport. Press Space / Add / Mesh / Tube. (Select 32 Vertices)



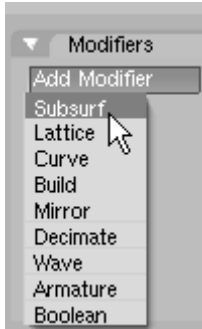
This places a Tube object in the scene in Edit Mode. Switch to Side View. Press the AKEY to deselect the vertices. Press the BKEY (Box Select) and box select the rightmost group of vertices. Press the EKEY (Extrude). Select Edges only and extrude the edges to the right as shown below doubling the length of the tube.



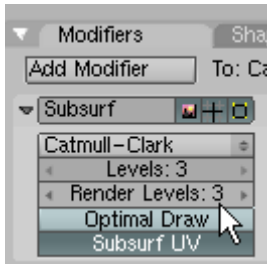
Extrude the edges 4 more times to create a tube object as shown below.



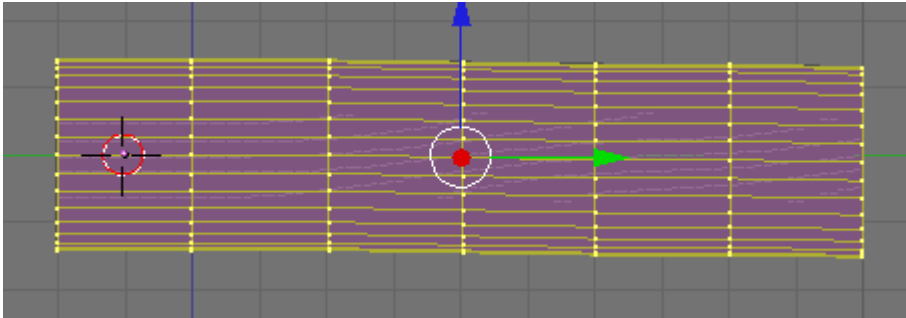
Press the AKEY to deselect the vertices. Press the AKEY again to select all of the vertices. In the modifier Panel press the Add New button. Select the SubSurf Modifier from the dropdown list.



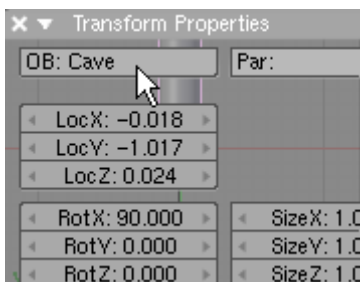
In the SubSurf controls set the Levels at 3 and the Render Levels at 3.



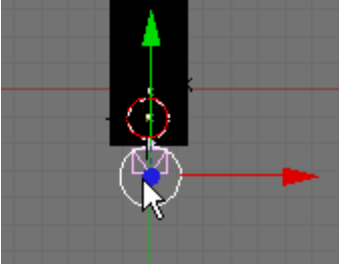
This creates a lot of vertices for us to displace.



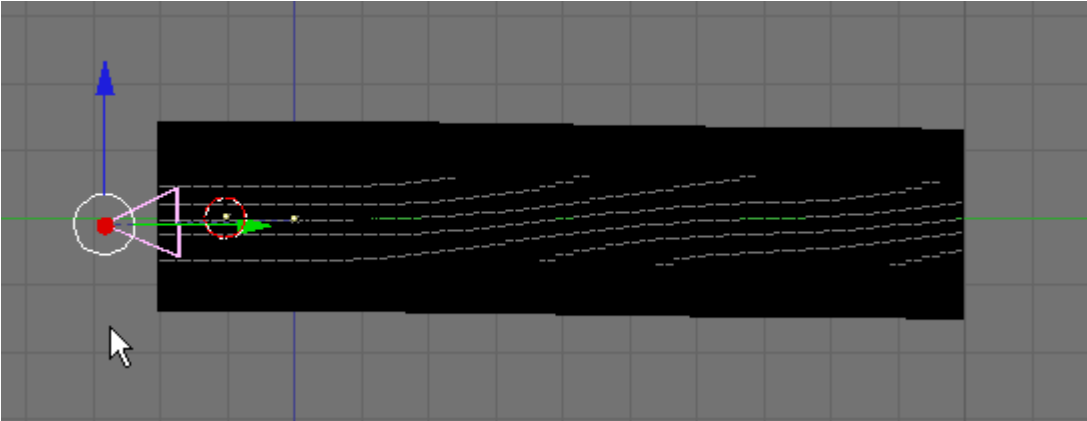
Press the **A**KEY to deselect the vertices. **TAB out of Edit Mode**. In the Transform Properties Panel name this object Cave.



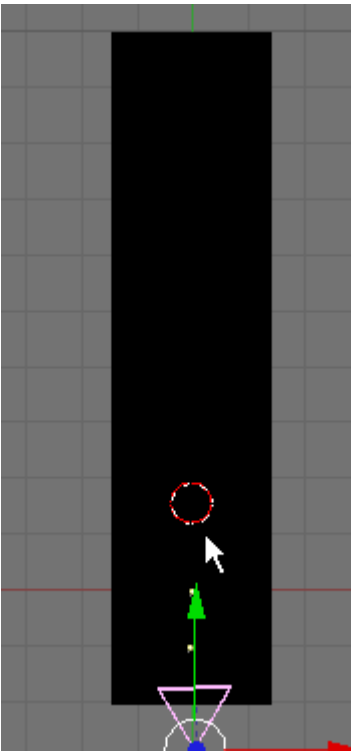
Add Layer 10 (Camera and Camera Focus) to the scene. Switch to TOP View. Grab the Camera object and move it down so it directly in front of the tube.



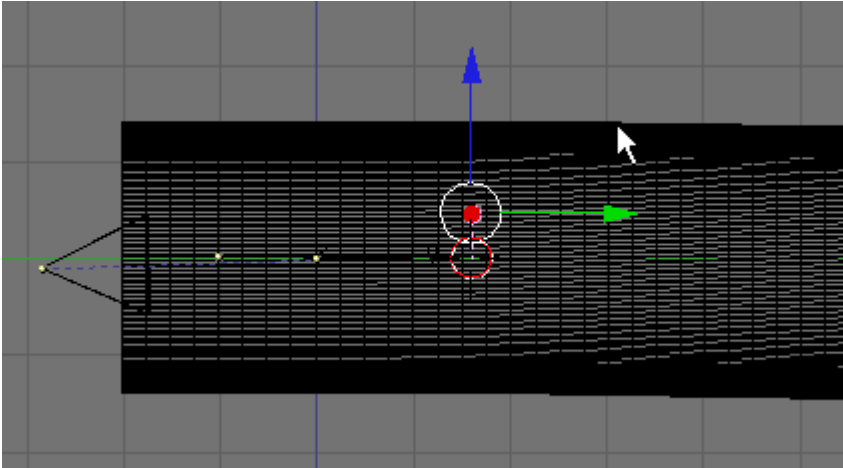
Switch to Side View and place the camera just inside the tube as shown below.



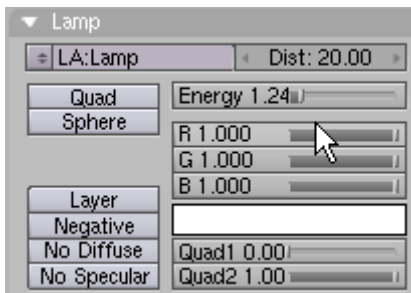
Switch to Top View. Place your 3D cursor in the center of the Cave object about a quarter of the way up as shown below.



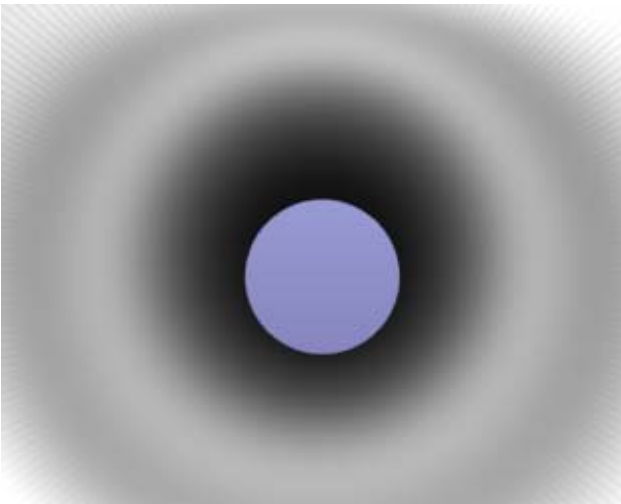
Press Space / Add / Lamp / Lamp. Switch to Side View. Move the Lamp slightly up as shown below.



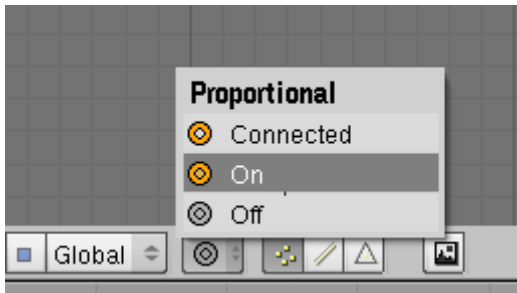
In the Lamp Panel set the Energy slider to 1.24



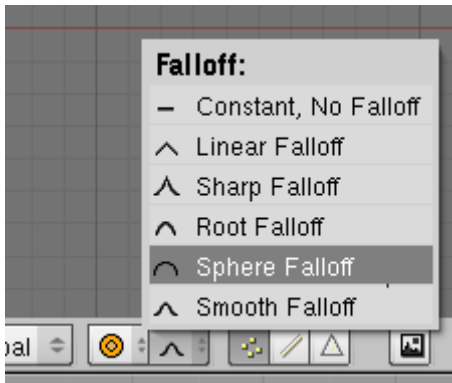
Render F12. The rendering should look like the image below.



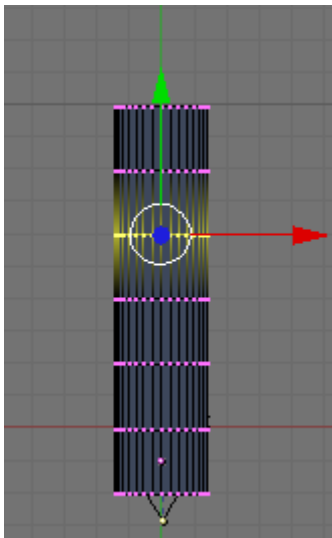
Switch to Top View and zoom out a bit. Select the Cave Object. TAB into Edit Mode. If any of the vertices are selected press the AKEY to deselect the vertices. Turn on the Proportional Editing.



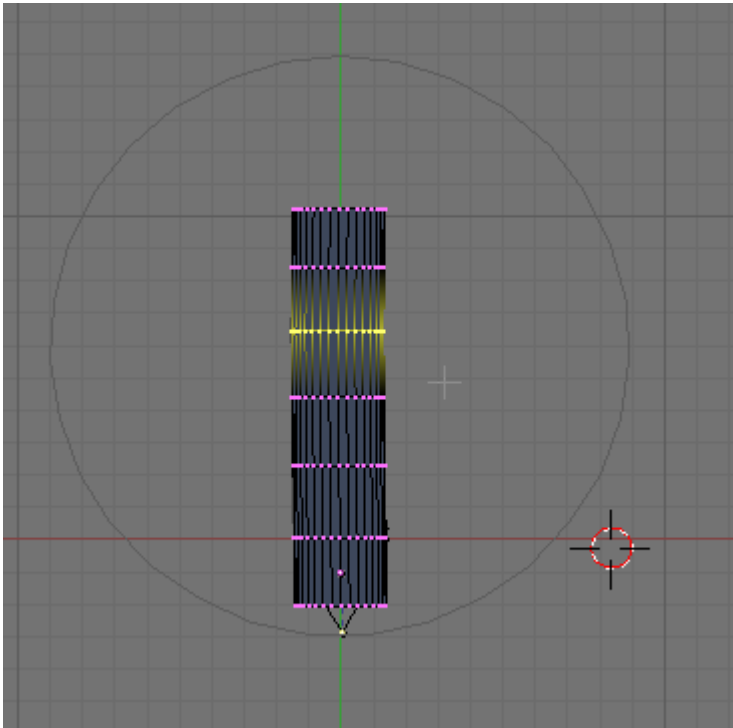
Select Sphere from the Falloff dropdown box.



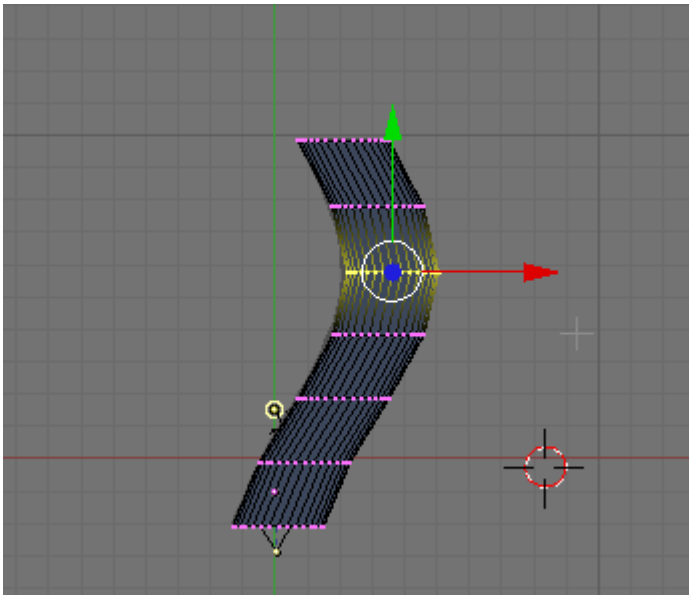
Press the BKEY and box select the third group of vertices from the top as shown below.



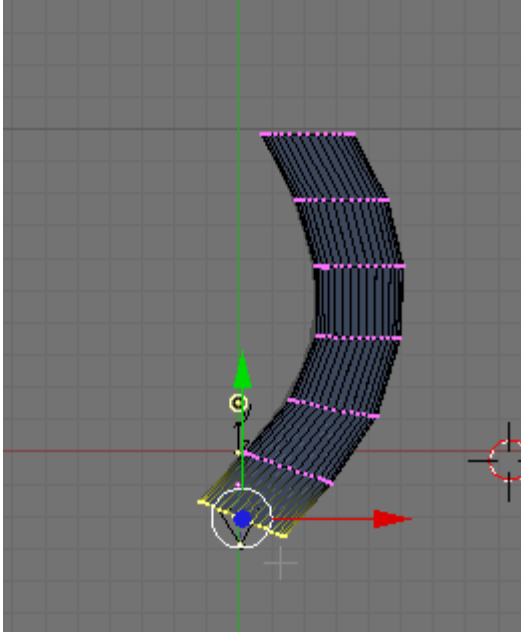
Press the GKEY (Grab). While in Proportional Editing Mode a circle will be displayed around the cursor. Use your track wheel to increase the size of this circle until it encompasses all of the vertices as shown below.



Move the selected vertices to the right a bit to form a slight bend in the object as shown below.



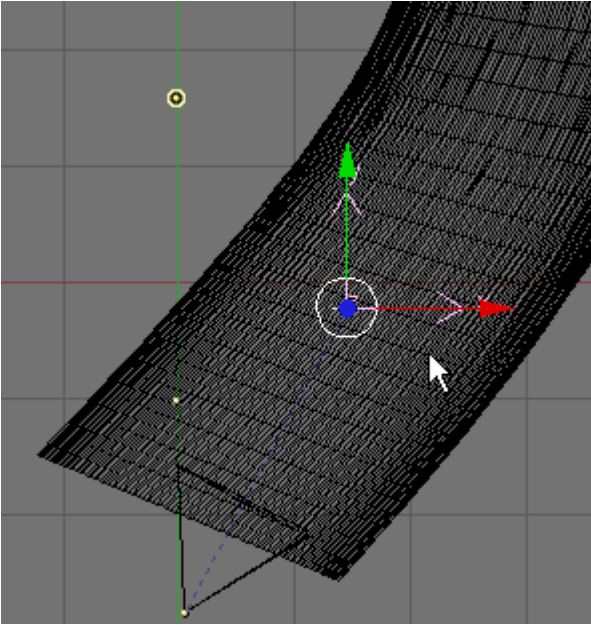
Press the AKEY to deselect the vertices. Box select the bottom Row of vertices. Press the RKEY (Rotation). Rotate these vertices (still in Proportional Editing) a bit to complete the curve in the Cave as shown below.



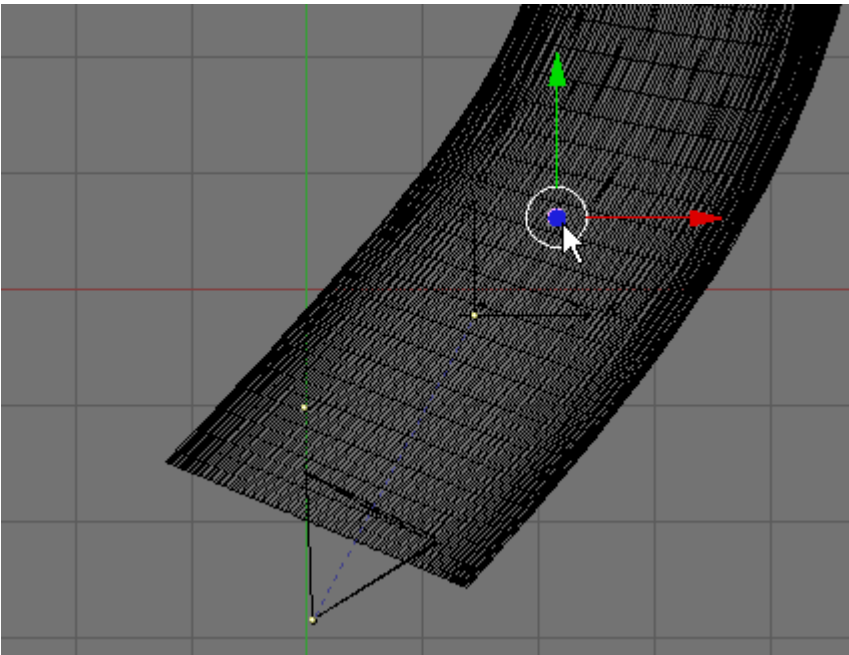
Press the AKEY to deselect the vertices. Turn off Proportional Editing. **TAB out of Edit Mode**. Select the Camera Focus from the Outliner Window.



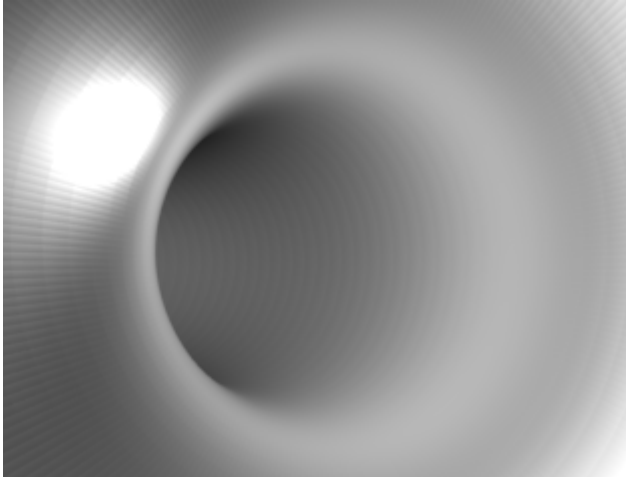
Zoom in a bit and move the Camera Focus back into the Cave object (The camera will follow it).



Select the Lamp object and move it back into the Cave object.



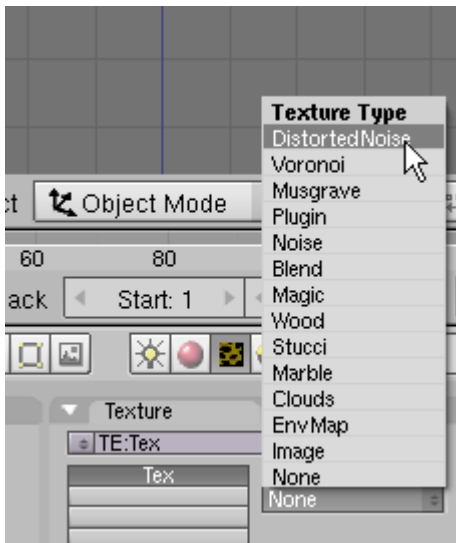
Render F12. The Rendering should look something like the image below. (Note: You may have to adjust the camera, or camera focus or light).



### Save your File F2.

We will use a displacement map to move the vertices forming a rough cave-like appearance. Unlike “bump” mapping where the face normals are skewed to create the illusion of depth (as we did in the Globe tutorial), displacement mapping creates real “bumps” that can cast shadows, occlude other objects and do everything real geometry does.

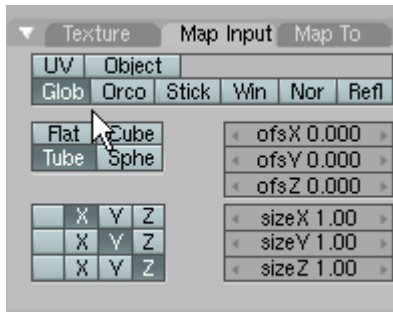
Select the Cave object. Press F5 (Shading) and press the Add New material button. In the Texture Panel press Add New. Press F6 (Texture) in the Texture Type dropdown box choose Distorted Noise. This is a built-in procedural texture.



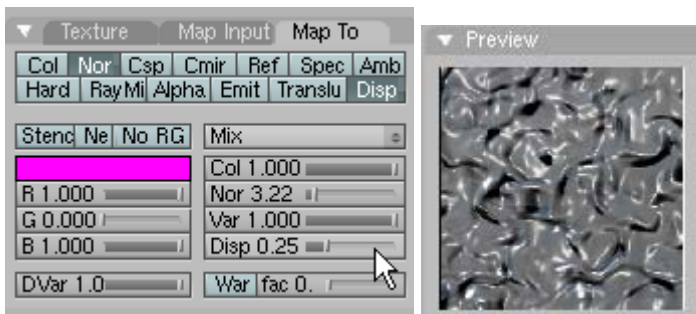
Press the Material Buttons sub-text icon (or Press F5).



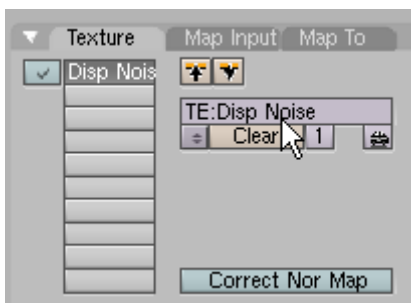
Press the MAP INPUT tab on the right. In the Map Input Panel select the Glob button for the texture coordinates and set the mapping to Tube.



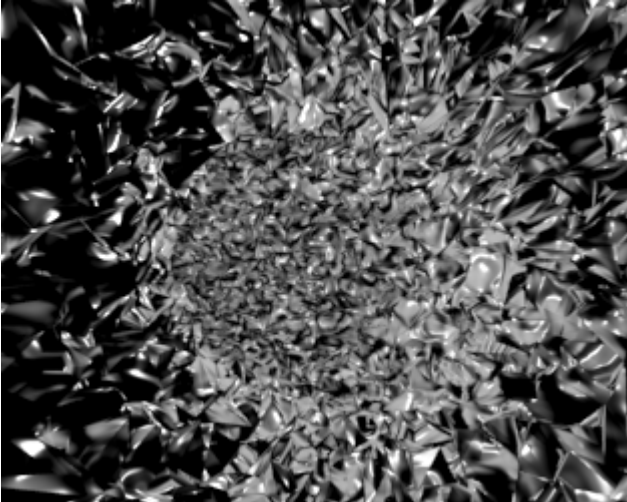
Press the MAP TO Tab. In the Map To Panel select the NORMAL and DISPLACEMENT buttons and de-select the Color button. This will make the distorted noise texture affect the object's normals and displacement. Then set the NOR slider to 3.22 and the DISP slider to .25



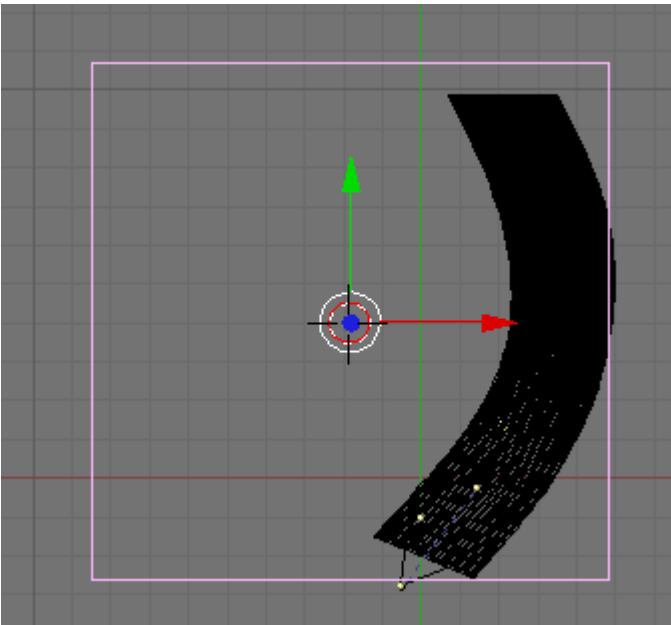
In the Texture Panel name this texture Disp Noise



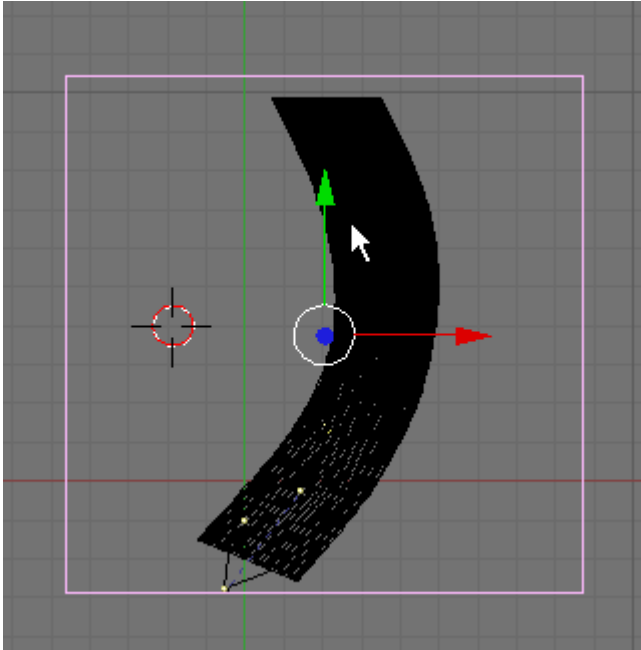
Render F12. The rendering should look something like the one below.



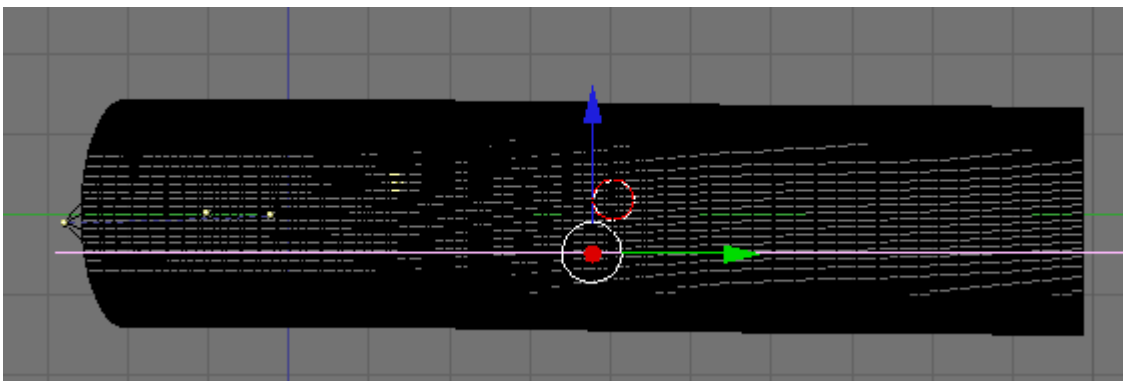
We will create a river to flow through the cave to better define it. Switch to top view and zoom out a bit. Place your 3D cursor outside of the cave object. Press Space / Add / Mesh / Plane. TAB out of Edit Mode. Press the SKEY (Scale) and scale the plane object so it is as large as the Cave



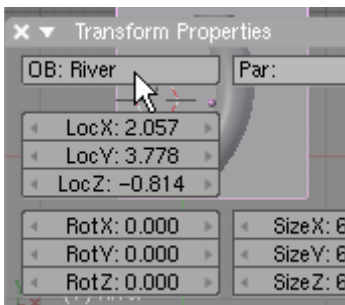
Grab the Plane and center it on the Cave object.



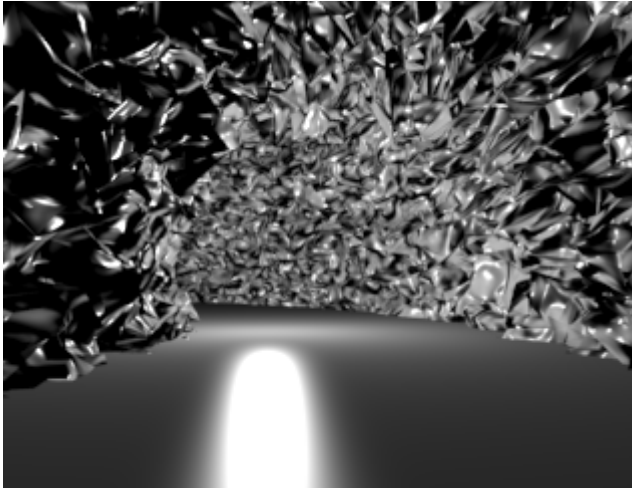
Switch to Side View and lower the Plane object below the camera level.



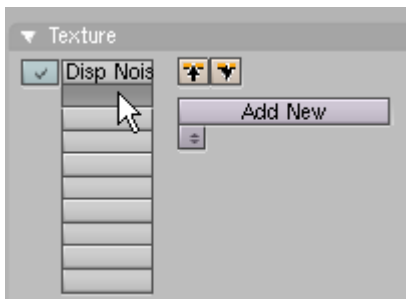
In the Transform Properties Panel name this object River.



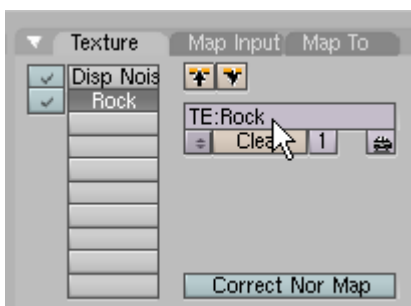
Render F12.



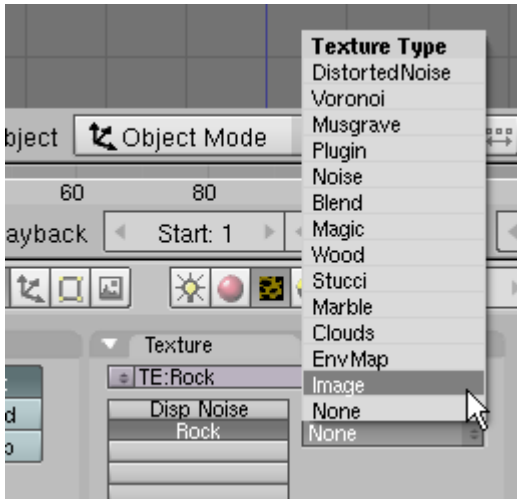
**Save Your File CTRL-W.** Select the Cave object. In the Texture Panel select the box below the Disp Noise texture then press the Add New button.



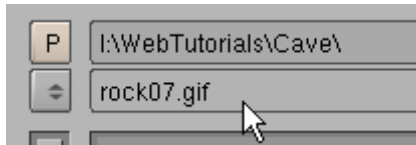
Name this texture Rock.



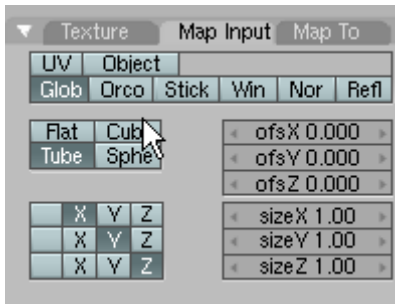
Press F6 (Texture). In the Texture Type dropdown box select Image.



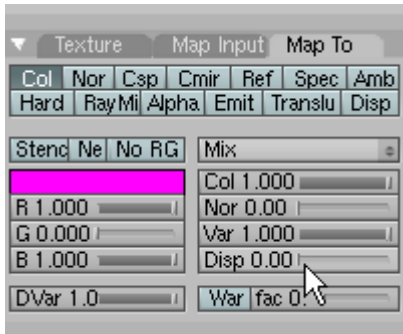
In the Image Panel press the Load Image button. Select the Rock07.gif image file. This file is located in the Cave.zip file.



Press F5 to return to the Materials buttons. Press the MAP INPUT tab on the right. In the Map Input Panel set the input coordinates to GLOBAL and the image mapping to Tube.



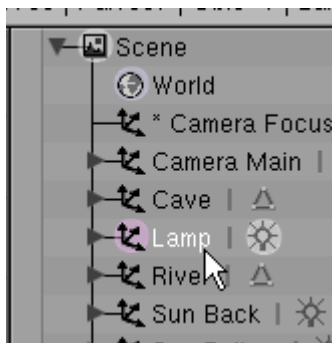
Press the MAP TO tab. In the Map To Panel set the NOR and DISP sliders to 0.



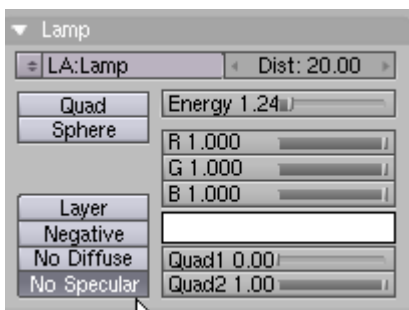
Press the Shaders Tab. In the Shaders Panel set the Spec to 1.65 and the Hardness to 399.



Select the Lamp object from the Outliner Window.



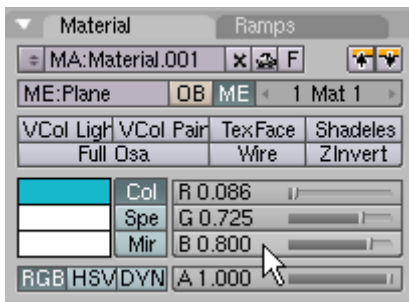
In the Lamp Panel press the No Specular button. This will disable specular shading.



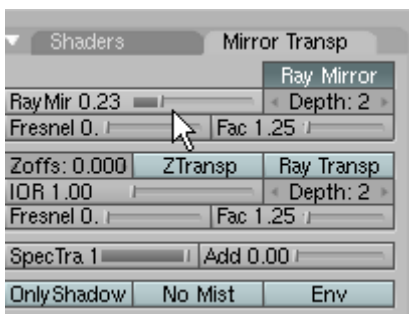
Render F12.



Select the River object. Press F5 (Materials) if not already displayed. In the Materials Panel press the Add New button. In the Materials Panel set the Red to .086, Green to .725 and Blue to .8

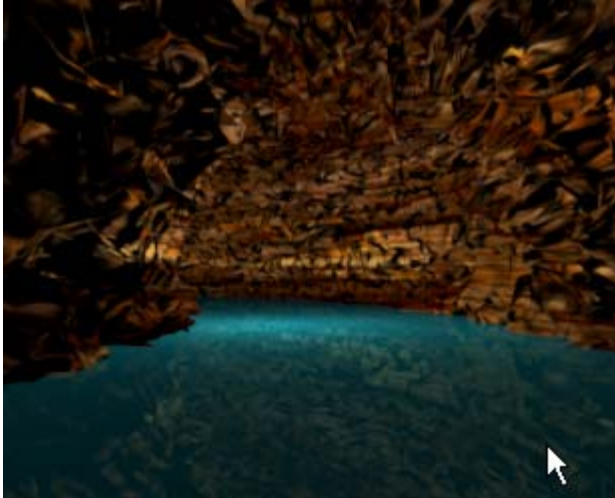


Press the MIRROR TRANS tab. In the Mirror Transparency Panel press the Ray Mirror button activating it and set the Ray Mirror slider to .23

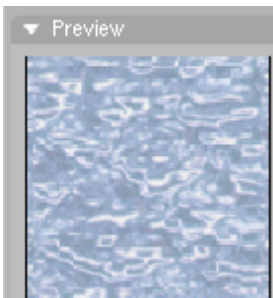


This gives the River object a mirror-like appearance reflecting the surrounding rock.

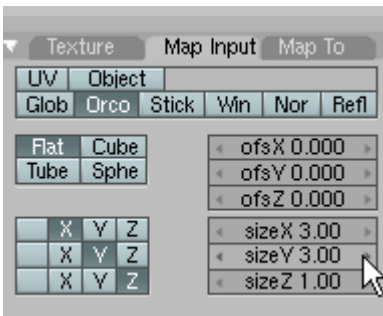
Render F12.



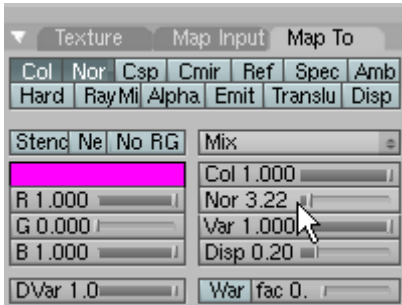
We will now add some ripples to the river. In the texture Panel press the Add New button. Press F6 (Textures). In the Texture Type dropdown box choose Image. In the Image Panel press Load Image. Select the Ripples2.gif image file. This file is located in the Cave.Zip file.



Press F5 to return to the Material Buttons. Press the MAP INPUT Tab on the right. In the Map Input Panel set the SIZE X and the SIZE Y to 3. This will display more ripples.



Press the MAP TO Tab. In the Map To Panel press the NOR button so that the texture is applied to both the COLOR and NORMALS and set the NOR slider to 3.22.



Render F12.



You may want to adjust the Camera, camera Focus and Lamp to get the best image.



A finished copy of this tutorial named CaveComplete.blend is located in the Cave.zip file.