

Assignment 1

Particle Systems

UCS636

3D Modelling and Animation

Submitted by

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3-COE-28

Submitted to

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Preview



Software Used:

Blender 2.79

Rendering Engine

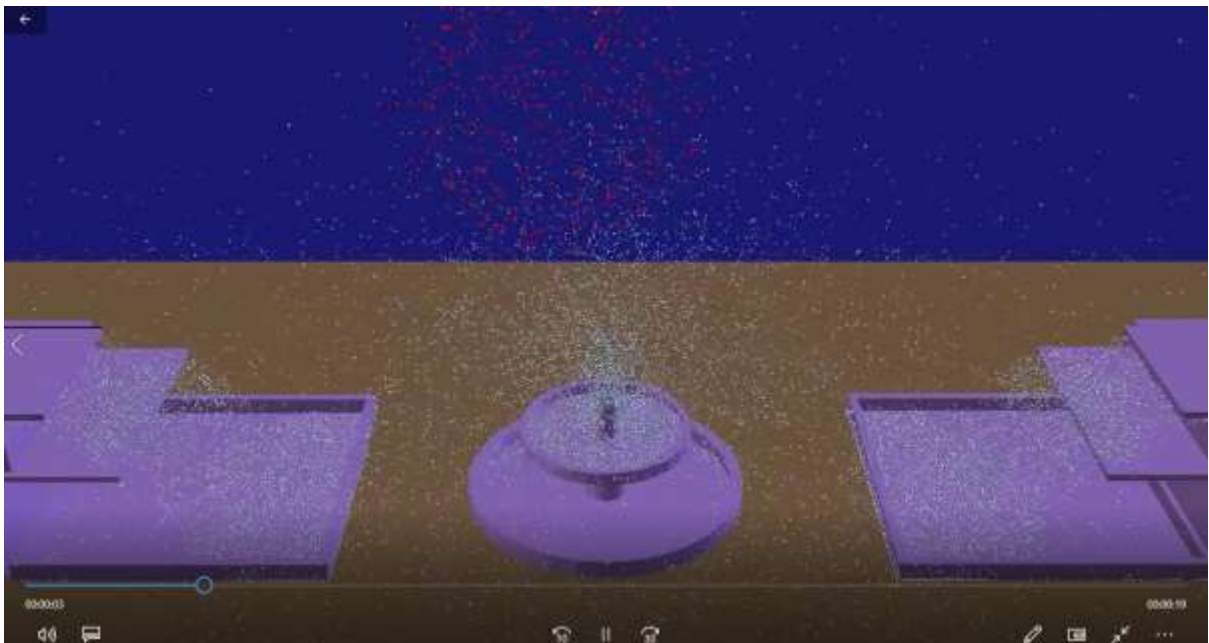
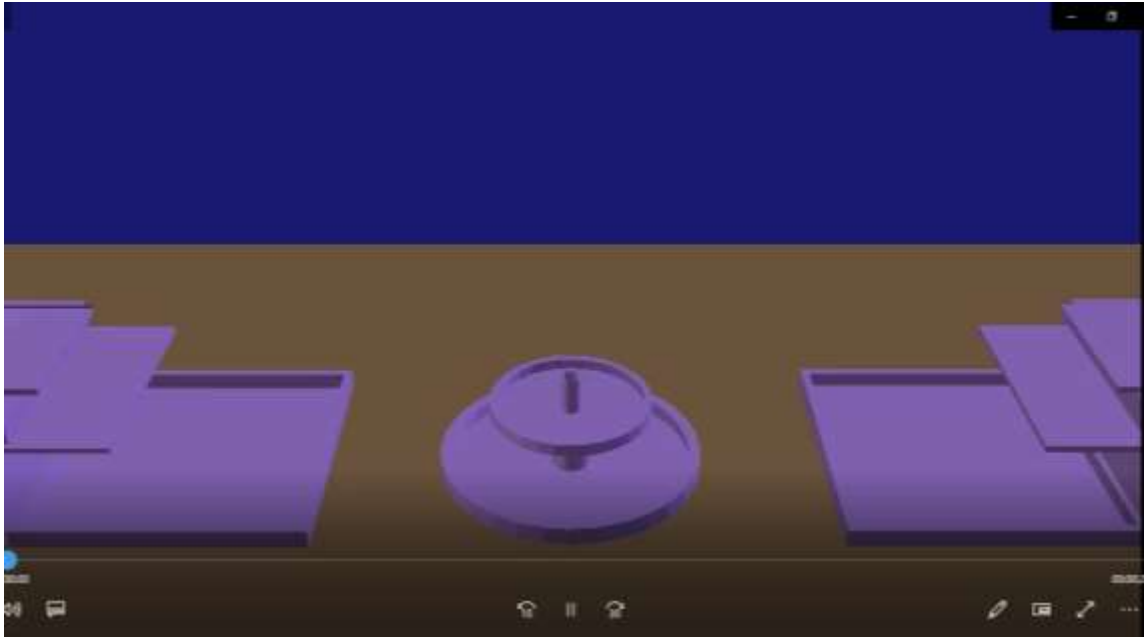
OpenGL



Computer Science and Engineering Department

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The video features a fountain, waterfalls and fireworks.



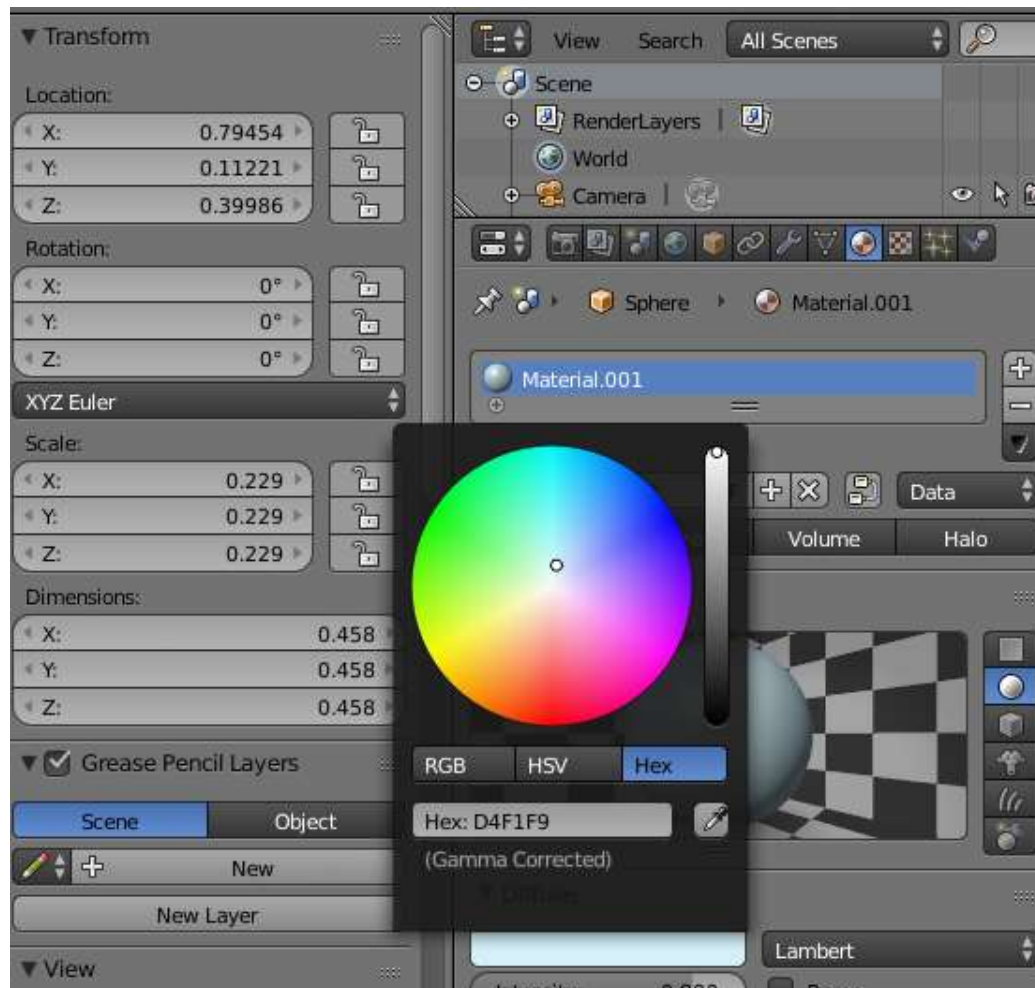
The steps are as follows:

Positioning the camera

Select the camera and set its location to (X = 15.96223, Y = 0, Z = 9.76826) and rotation to (X = 60°, Y = 0°, Z = 90°).

Modelling of the Water droplet

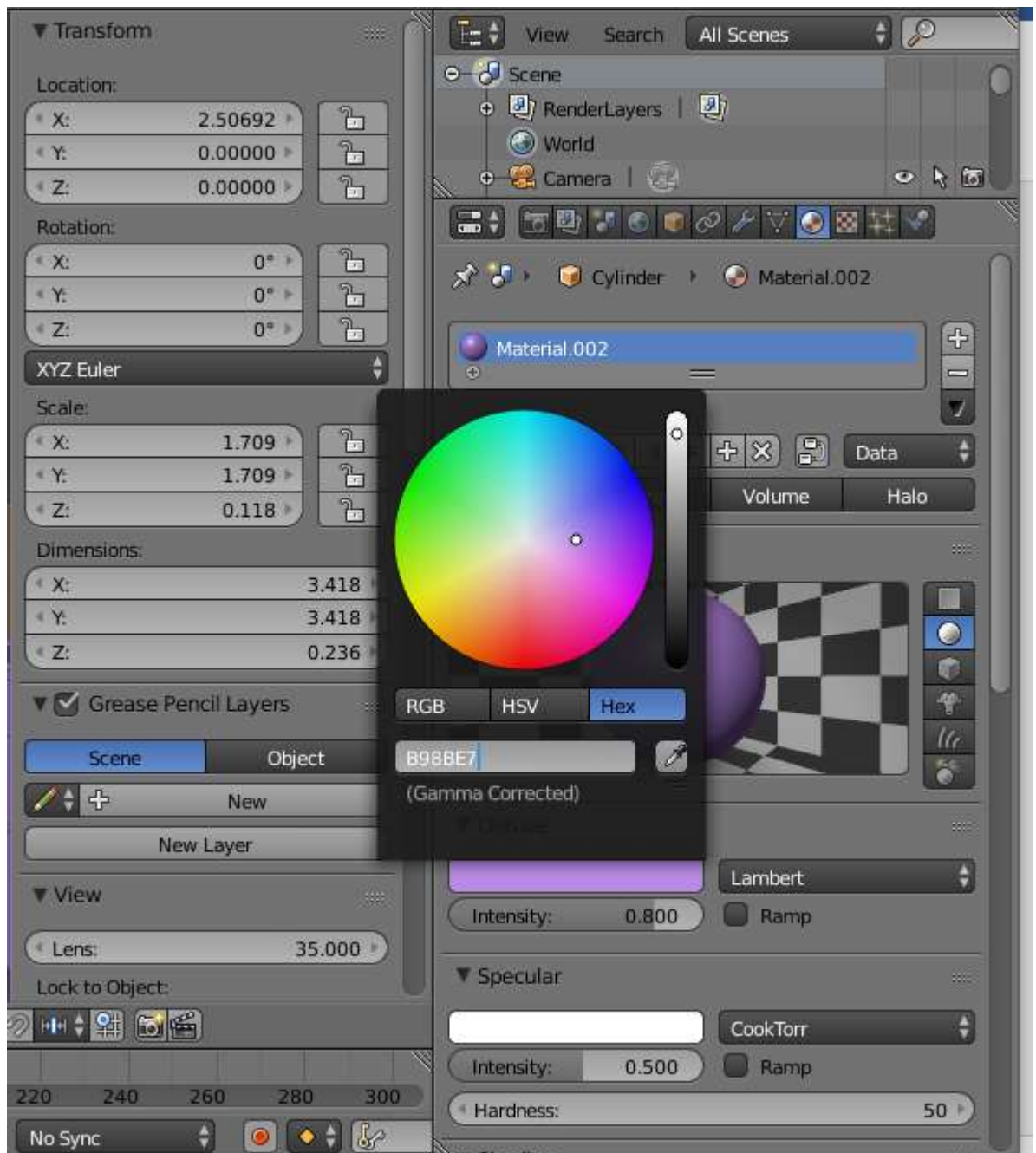
Step 1: In second layer. Use Shift+A>Mesh>UV Sphere to add a UV sphere. Scale it to (X = 0.229, Y = 0.229, Z = 0.229). In the materials, set its diffusion value to #D4F1F9 in hexadecimal.



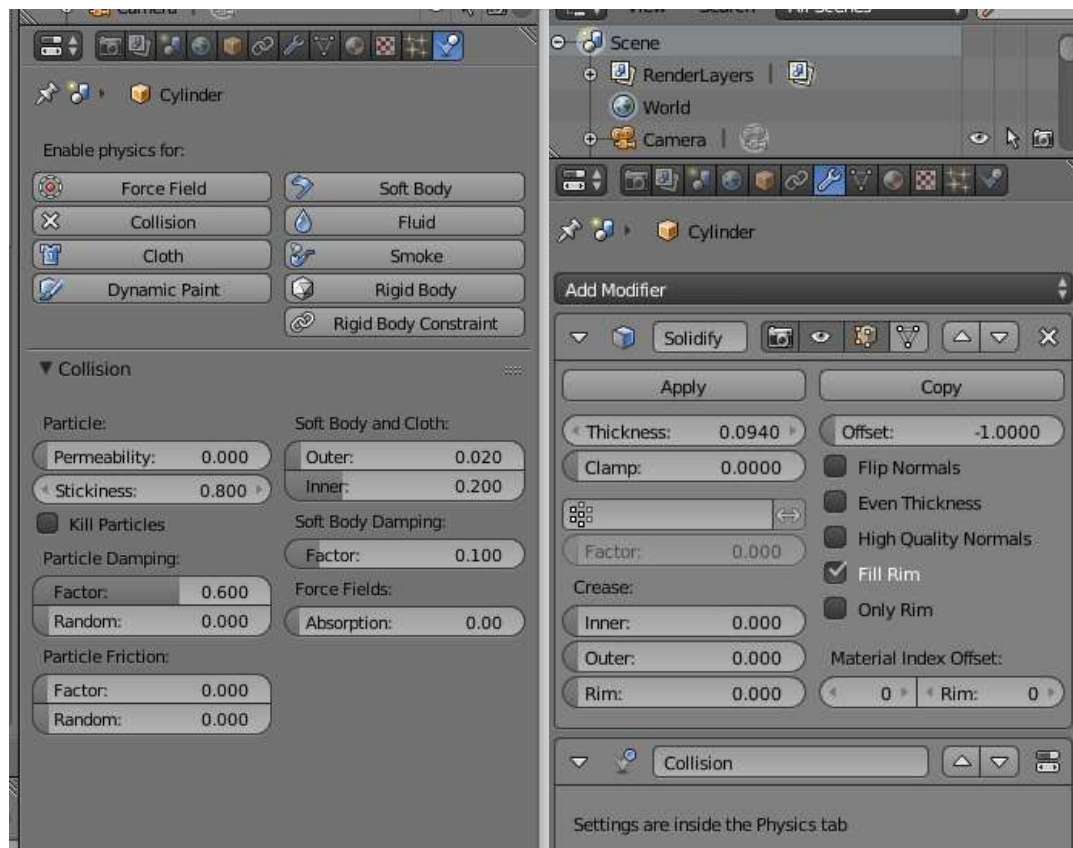
Modelling of World: In the world tab, set the horizon, zenith and ambient colours to #191970 hexadecimal colours.

Modelling of Fountain

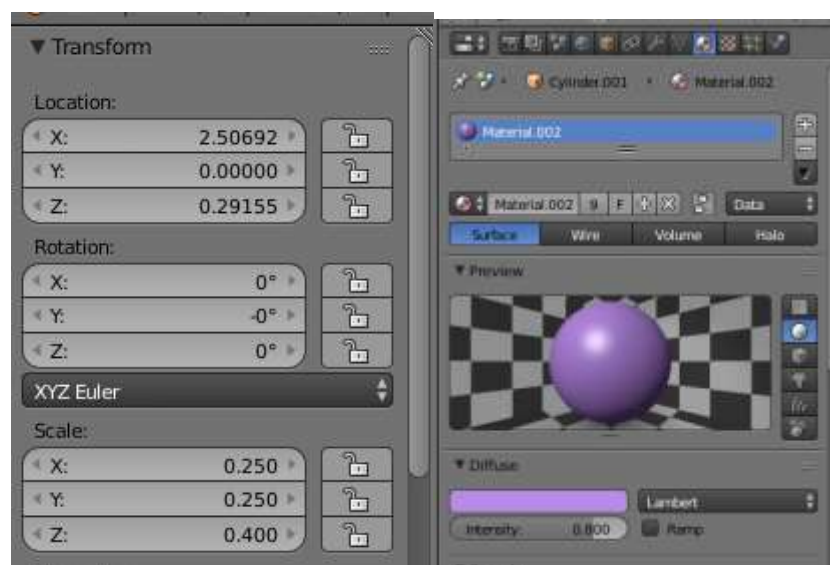
Step 1: Use Shift+A>Mesh>Cylinder to add a cylinder. In edit mode, delete its top face. Go back to object mode with the cylinder selected, in the properties panel, set its location to (X = 2.50692, Y=0, Z=0), scale it to (X=1.709, Y=1.709, Z=0.118). With the cylinder selected, In the materials tab in the Properties panel, set the diffuse colour to #B98BE7 in hexadecimal.



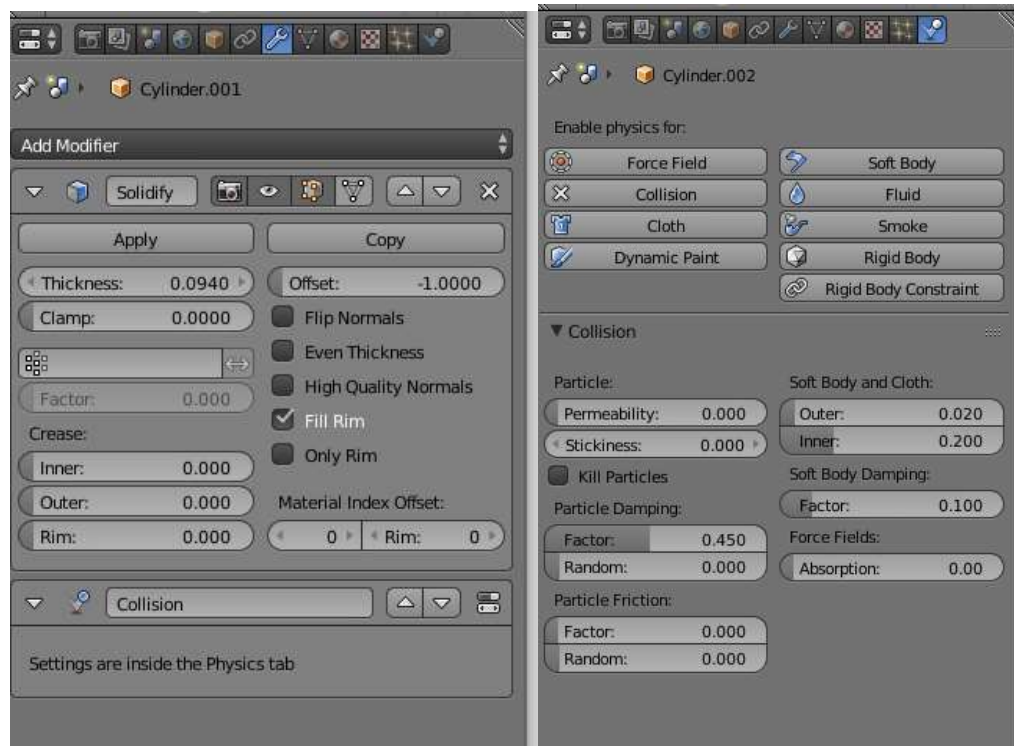
Step 2: With the same cylinder selected, in the Physics tab, enable physics for collision and set the stickiness to 0.8 and damping to 0.6 and in the object modifiers tab, add a solidify modifier and set the thickness to 0.0940



Step 3: The base of the fountain is ready. Now for rest of the modelling of the fountain, add a cylinder and set its location to (X = 2.50692, Y = 0, Z = 0.29155) and scale to (X = 0.250, Y= 0.250, Z=0.4) and set its diffuse in materials to #B98BE7 in hexadecimal.



Step 4: With this cylinder selected, add a solidify modifier and set its thickness to 0.0940. In the physics tab, enable physics for collision and set damping to 0.450

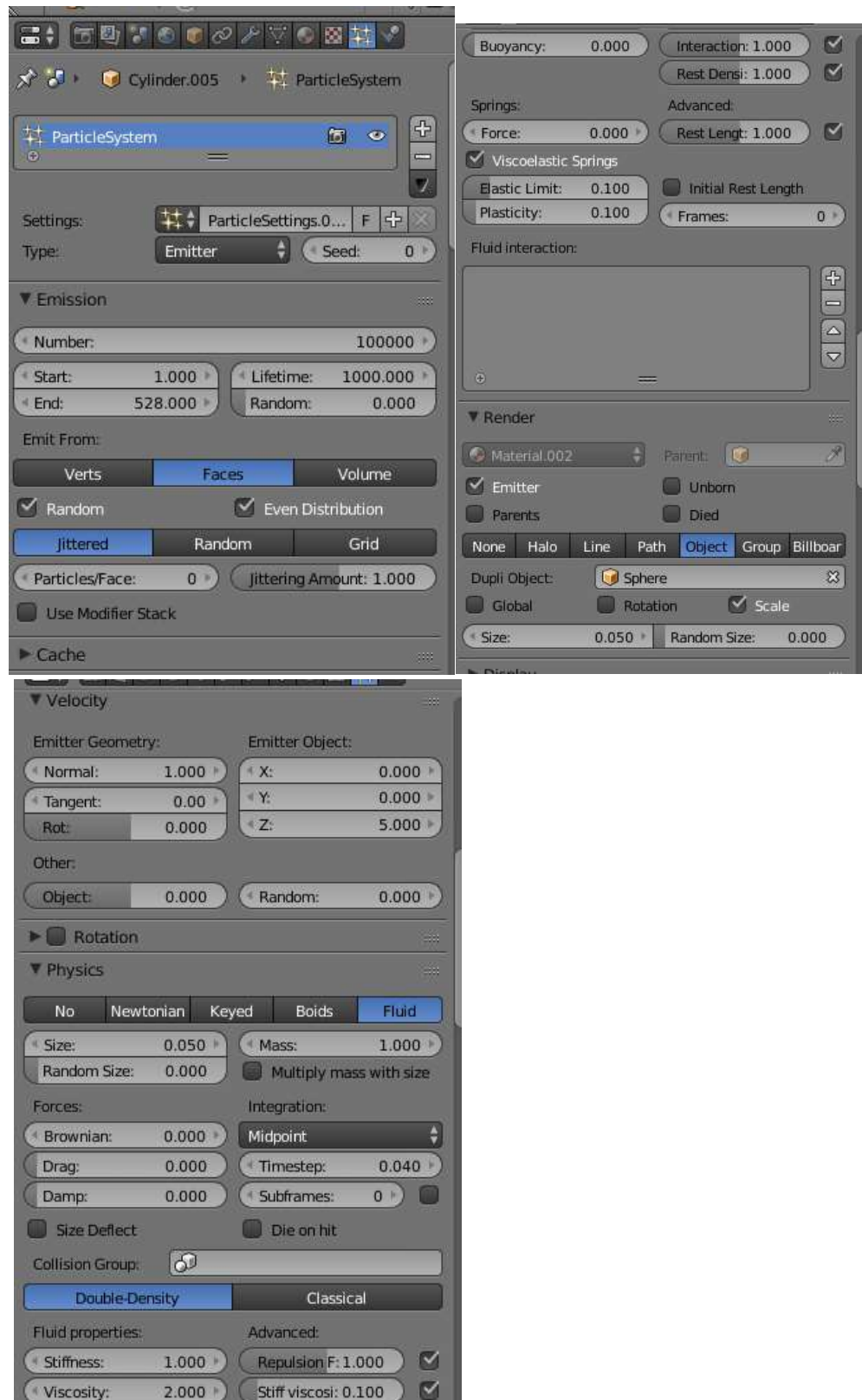


Step 5: Now add another cylinder and remove its top face. Set its location to (X = 2.50692, Y = 0, Z = 0.79650) and scale to (X = 1.05, Y = 1.05, Z = 0.083). In the object modifiers tab, add a solidify modifier and set its thickness to 0.0940. Add a material with colour #B98BE7. In the physics tab, enable physics for collision and set the damping factor to 0.450. The upper tub is ready.

Step 6: Now add another cylinder and remove its top face in edit mode. Come back to object mode. Now, set its location to (X = 2.50692, Y = 0, Z = 0.96299) and scale it to (X = 0.125, Y = 0.125, Z = 0.250). In the object modifiers tab, add a solidify modifier and set its thickness to 0.0850. In the physics tab, enable physics for collision and set the damping factor to 0.450. The source of water is ready.

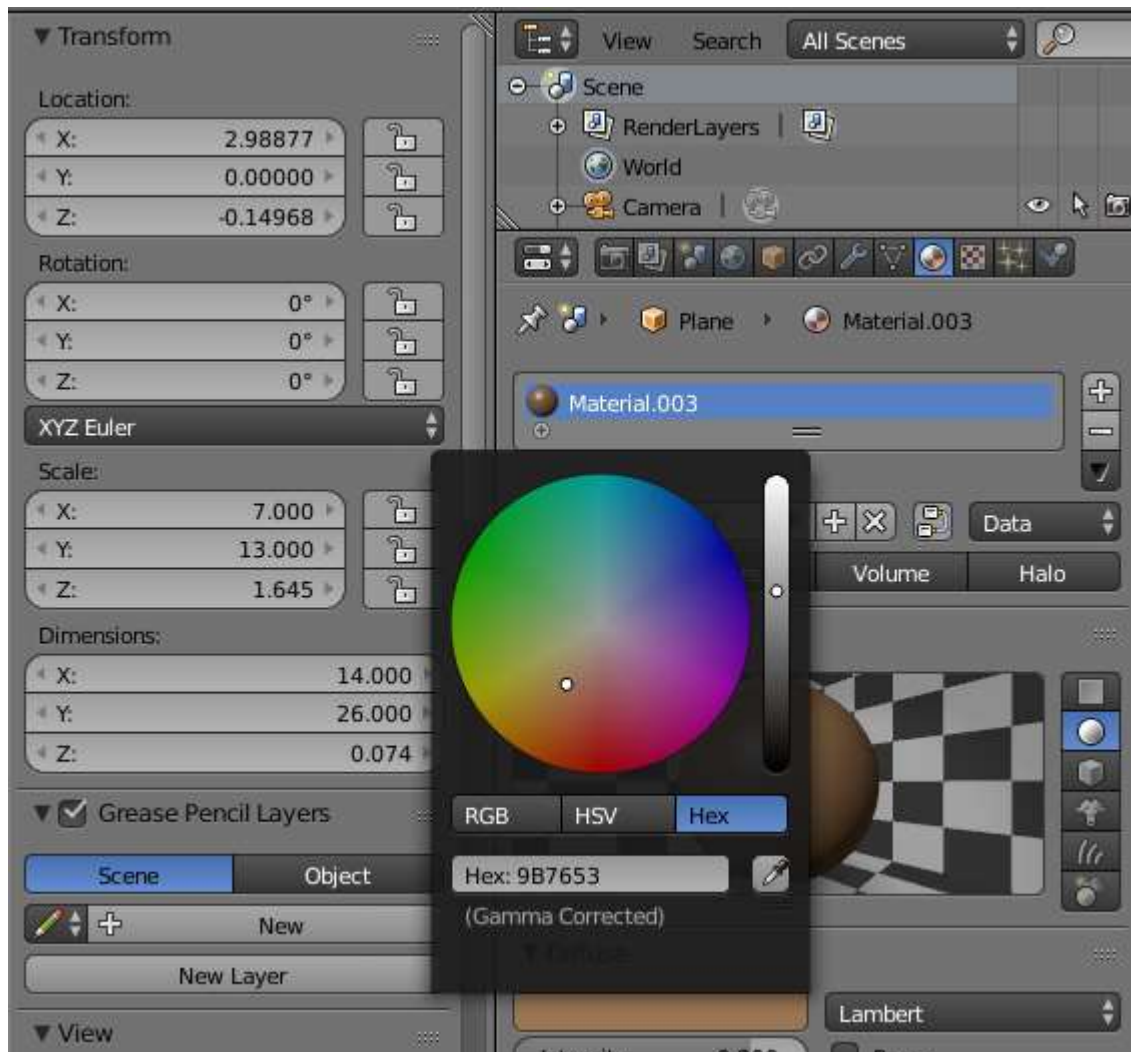
Step 7: With this cylinder selected, in the particle system, add a new particle system. Set the number of particles to 1,00,000, start frame to 1 and end frame to 528. Set the lifetime to 1000. In the velocity submenu, set the initial velocity in Z to 5. In the Physics submenu in the particles tab, select fluid. In the render submenu, select object and then select the sphere (that was modelled for water).

Step 8: The fountain is ready.

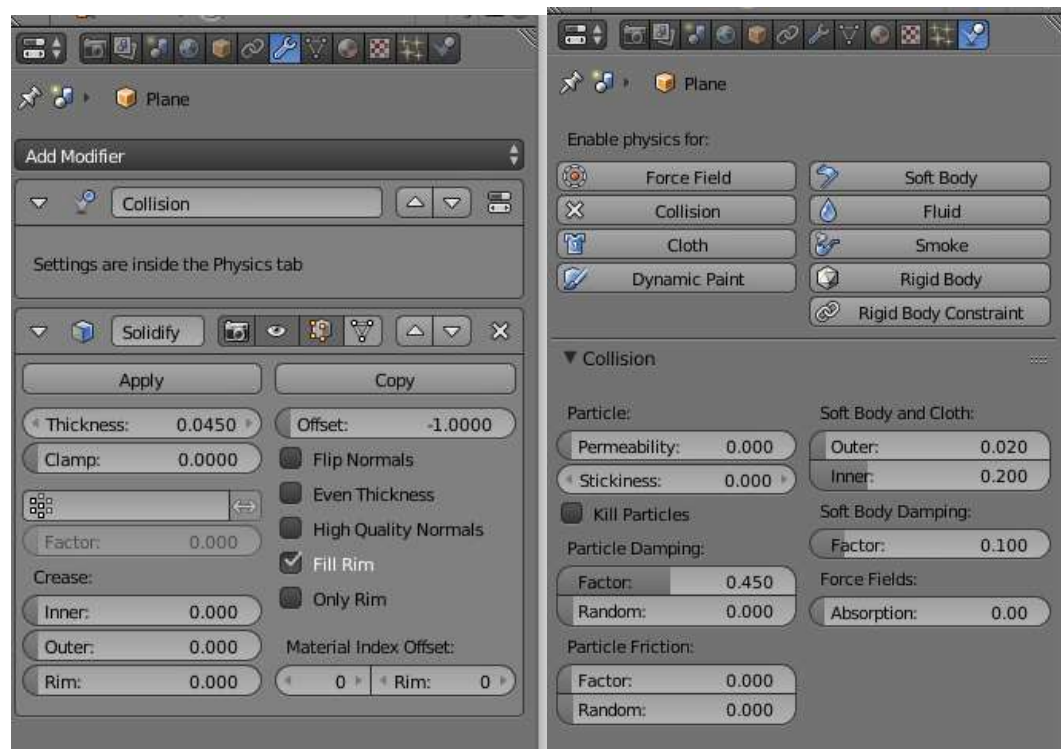


Modelling of Base

Step 1: Add a new plane. Set its location to (X = 2.98877, Y = 0, Z = 0.14968) and scale it to (X = 7, Y = 13, Z = 1.645). In the materials tab, set its diffusion colour to #9B7653



Step 2: In the modifiers tab, add a solidify modifier and set the thickness to 0.0450. In the Physics tab, enable Physics for collision and set the damping to 0.450.



Step 3: The base is ready.

Modelling of Waterfall

Step 1: Add a cube. Remove its top face. Scale it to (X = 1.803, Y = 1.803, Z = 0.118). Set its location to (X = 2.50692, Y = -4.95518, Z = 0.03692). In the materials tab, set its diffusion colour to #B98BE7. In the object modifiers tab, add a solidify modifier and set its thickness to 0.0850. In the physics tab, enable physics for collision and set its stickiness to 0.8 and particle damping factor to 0.6.

Step 2: Add another cube. Set its location to (X = 2.50692, Y = -8.60162, Z = 0.35188) and scale it to (X = 1.709, Y = 1.709, Z = 0.752). In the physics tab, enable collision and set particle damping factor to 0.450. In the materials tab, set the diffusion colour to #B9B8E7.

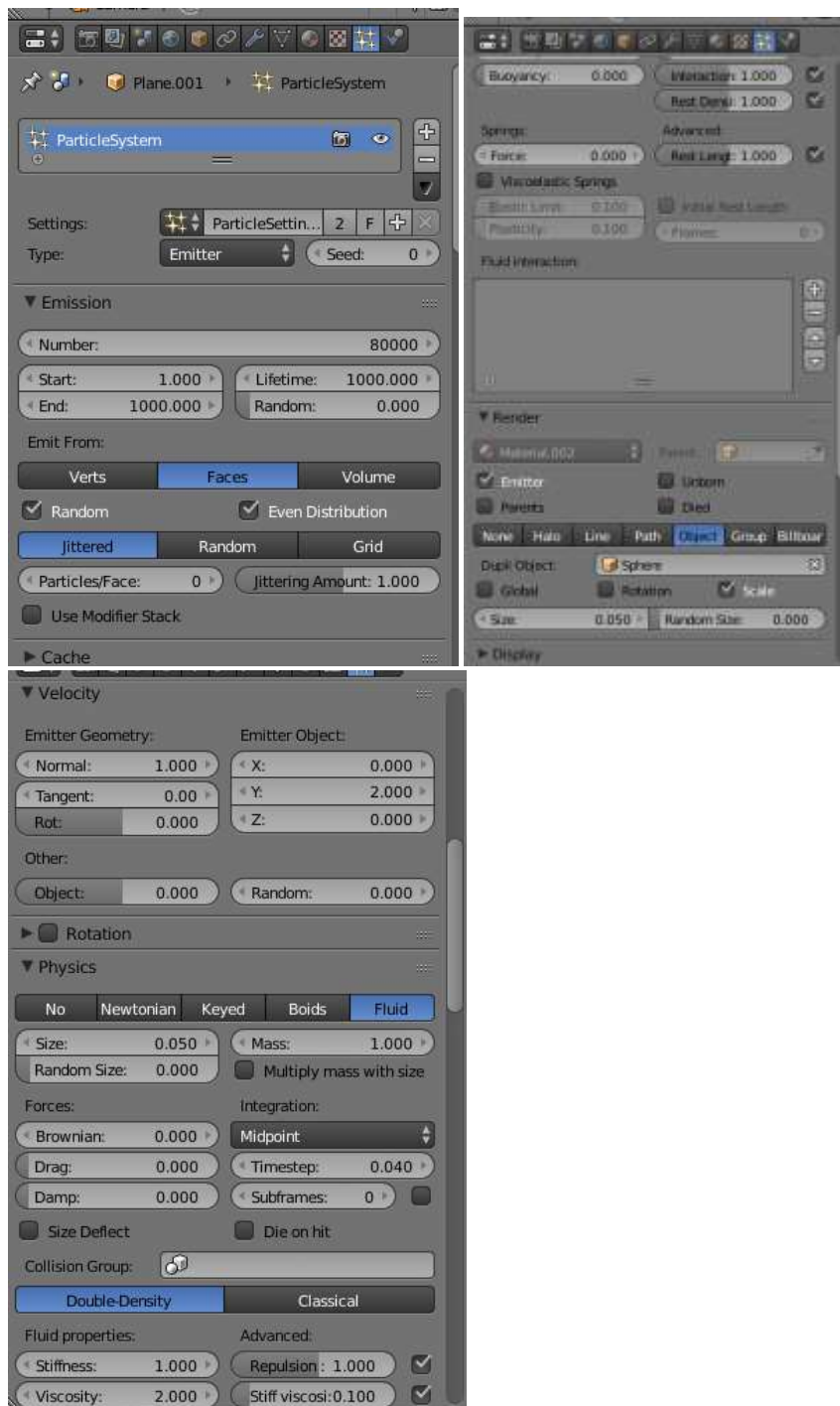
Step 3: Add a plane. Set its location to (X = 2.50692, Y = -6.88587, Z = 1.11281) and scale it to (X = 1.427, Y = 1.427, Z = 1). From the object modifiers, add a solidify modifier and set the thickness to 0.0850. In the materials tab, set the diffusion colour to #B9B8E7. From the Physics tab, enable Physics for collision and set the particle damping factor to 0.45.

Step 4: Now add another cube. Set its location to (X = 2.50692, Y = -8.06637, Z = 1.35104) and scale it to (X = 1.427, Y = 1.427, Z = 0.176). In the physics tab, enable collision and set particle damping factor to 0.450. In the materials tab, set the diffusion colour to #B9B8E7.

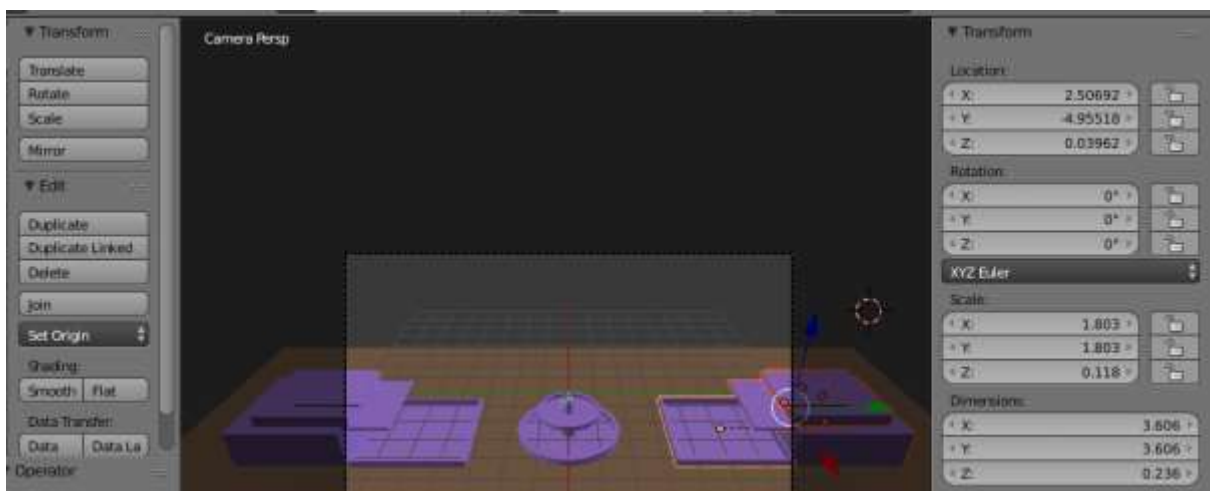
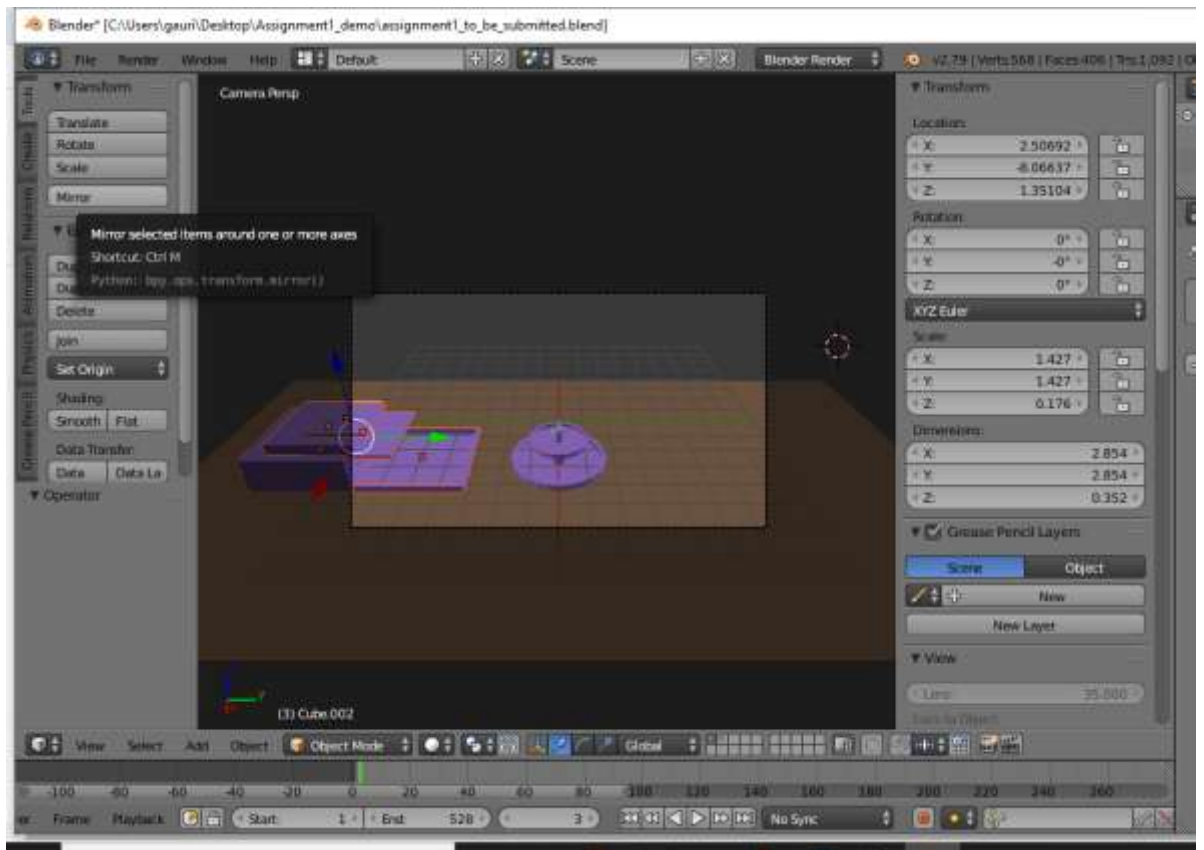
Step 5: Now add another plane. Set its location to (X = 2.50692, Y = -7.34720, Z = 1.166843) and scale it to (X = 1, Y = 1, Z = 1). From the object modifiers, add a solidify modifier and set the thickness to 0.0850. In the materials tab, set the diffusion

colour to #B9B8E7. From the Physics tab, enable Physics for collision and set the particle damping factor to 0.45.

Step 6: With the plane selected that was created and modified in step 1, add a new particle system from the Particles tab. Set number of particles to 80000, start frame to 1, end frame to 1000 and lifetime to 1000. In the velocity submenu, set the velocity to 2 in Y-direction. In the Physics submenu, select fluid. In the render submenu, from the dropdown choose the sphere that we used in the beginning for the water droplet.



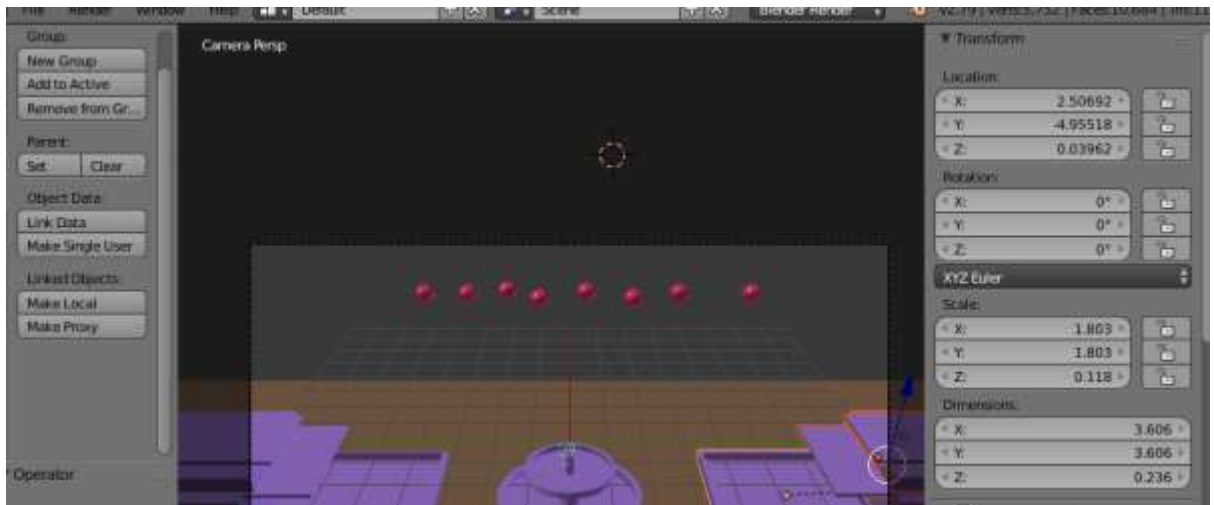
Step 7: Now select all the objects modelled in steps 1 through 5, use Shift+d to duplicate it. With the duplicated object(s) selected, click on the mirror button in the left panel and then press Y to mirror it along Y-axis. Now press G to grab the duplicated objects and set its location to (X = 2.50692, Y = -4.95518, Z = 0.03962).



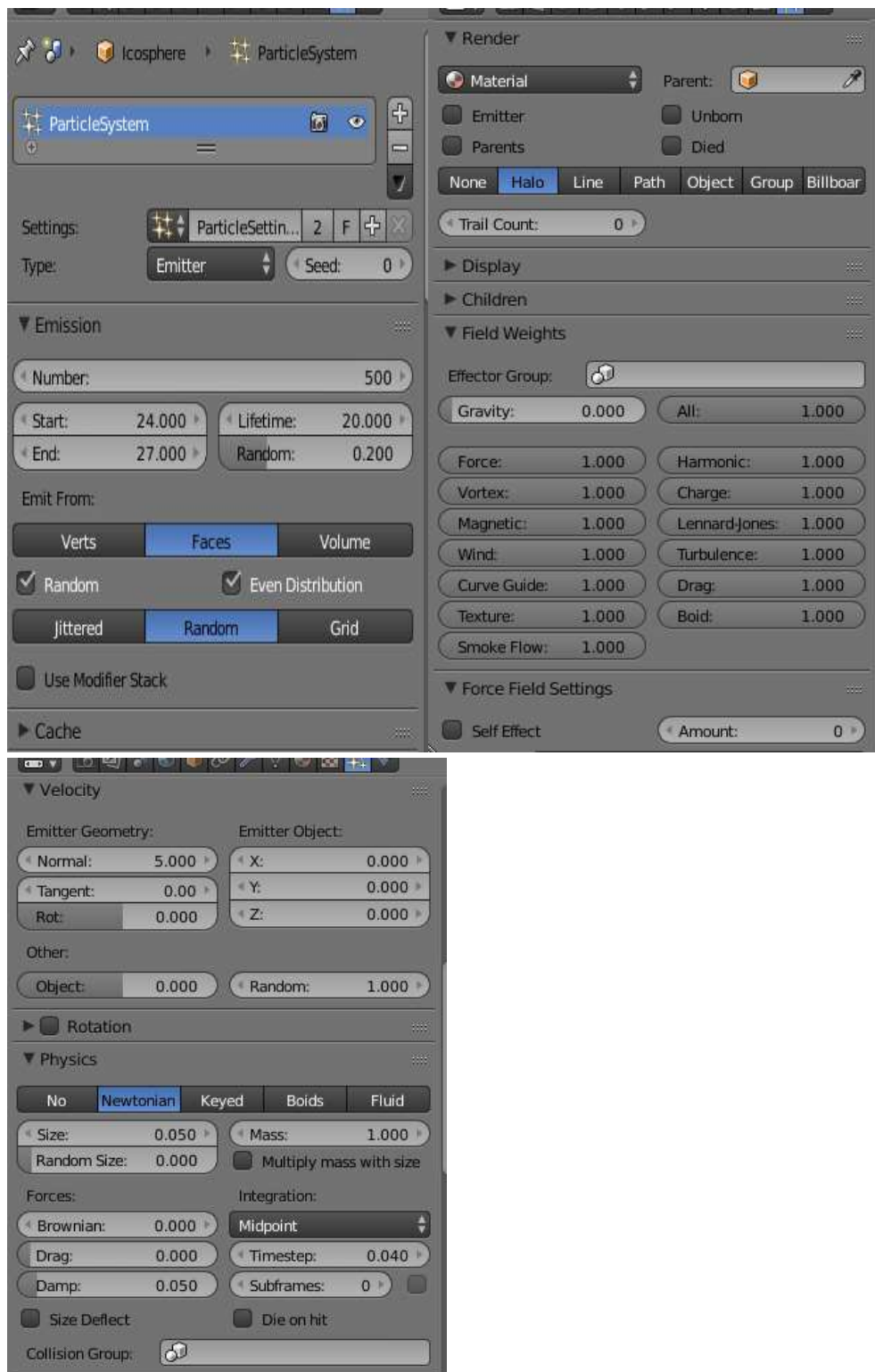
Step 8: Waterfalls are ready on both sides.

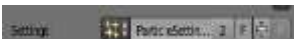
Modelling of Fireworks

Step 1: Add an icosphere and set subdivisions to 4. In the materials tab, set diffusion colour to (R, G, B) = (1, 0, 0). Change its scale to (X = 0.193, Y = 0.193, Z = 0.193) and place it somewhere above the horizon within the camera frame.



Step 2: In the particles tab, add a new particle system. Set the number to 500. Set start frame to 24 and end frame to 27. Set lifetime to 20 and random lifetime to 0.2. Select random from the emission tab to ensure random emission of particles. In the velocity submenu, in the emission geometry, set the normal to 5. Set the random emission velocity to 1. In the Physics submenu, set the damping to 0.05. In the render submenu, uncheck render emitter and select halo. In the field weights submenu, set gravity to 0.

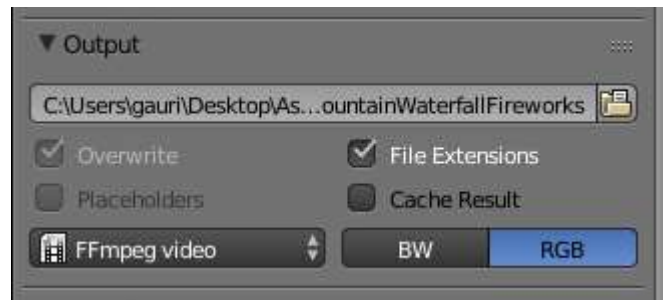


Step 3: Duplicate this sphere using shift+d and position it to a suitable value. Now in the particles tab, click on the number near particle system settings at top  to make it a single user. Now change the start and end frame for different time of firework. Repeat with 8 more icospheres but make sure the end frame doesn't exceed 528. Thus, fireworks have been modelled and animated over the video.

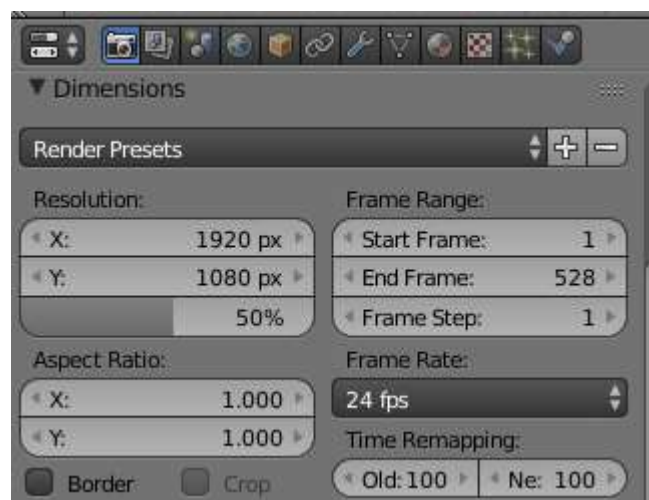
Rendering

Step 1: Press F12.

Step 2: In the render tab, in the output submenu, select FFMPEG file extension and enter the directory where you want the output video to be saved,



Step 3: In the 'dimensions' submenu, select the start frame to 1 and the end frame to 528.



Step 4: Now in the Render Menu>Select OpenGL Render Animation.

Step 5: Within some time, the video file will be there in the directory specified.

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