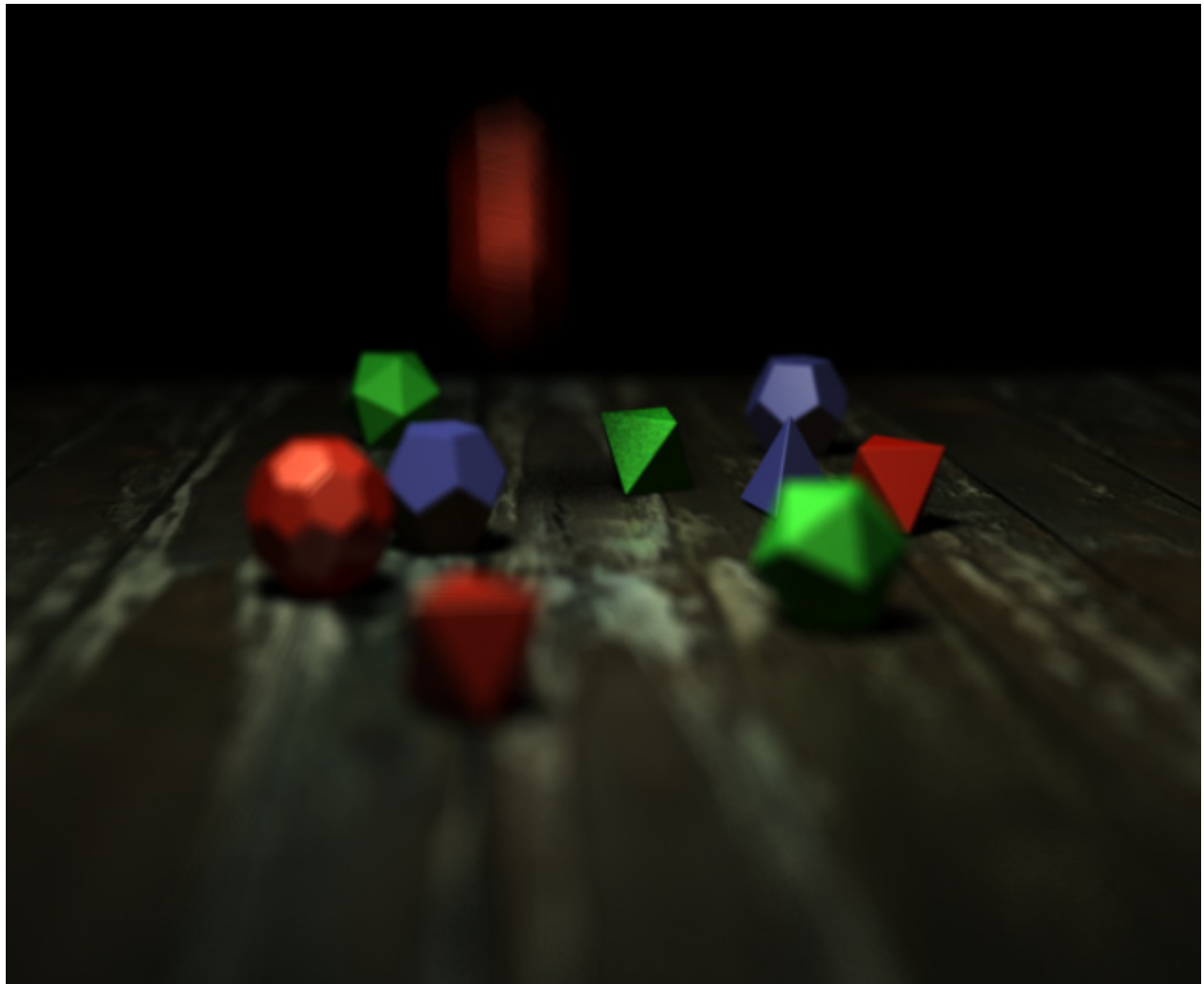
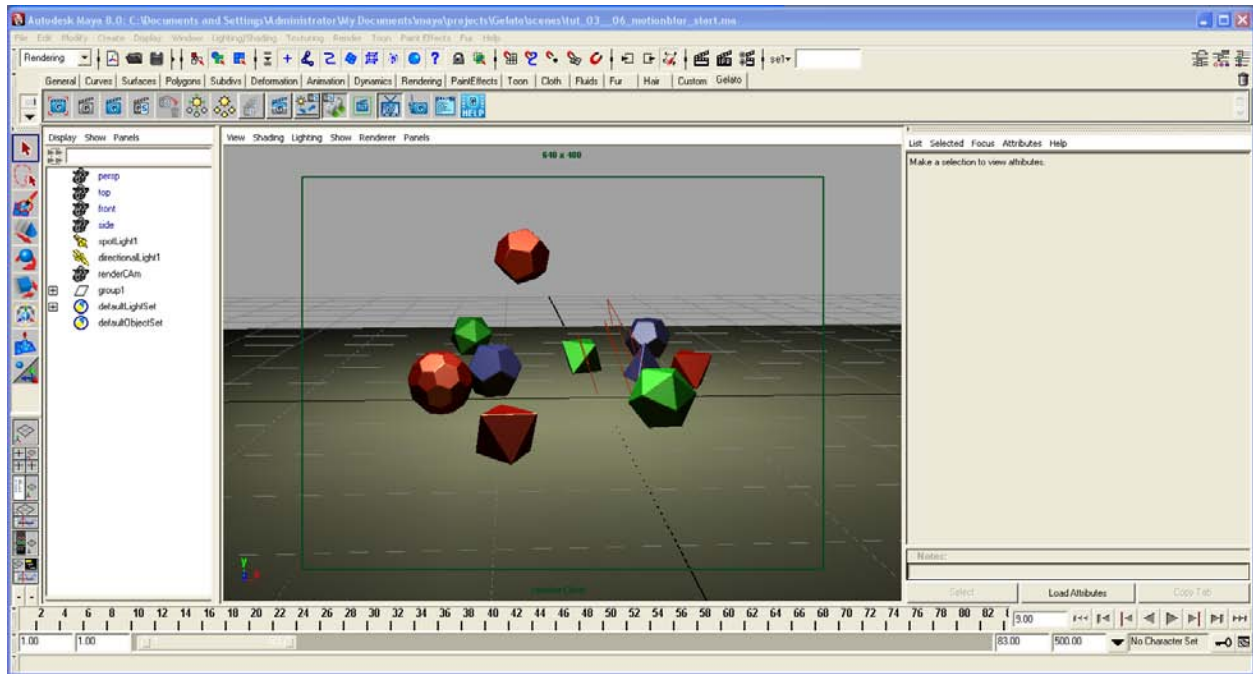


3.6 MOTION BLUR & DEPTH OF FIELD



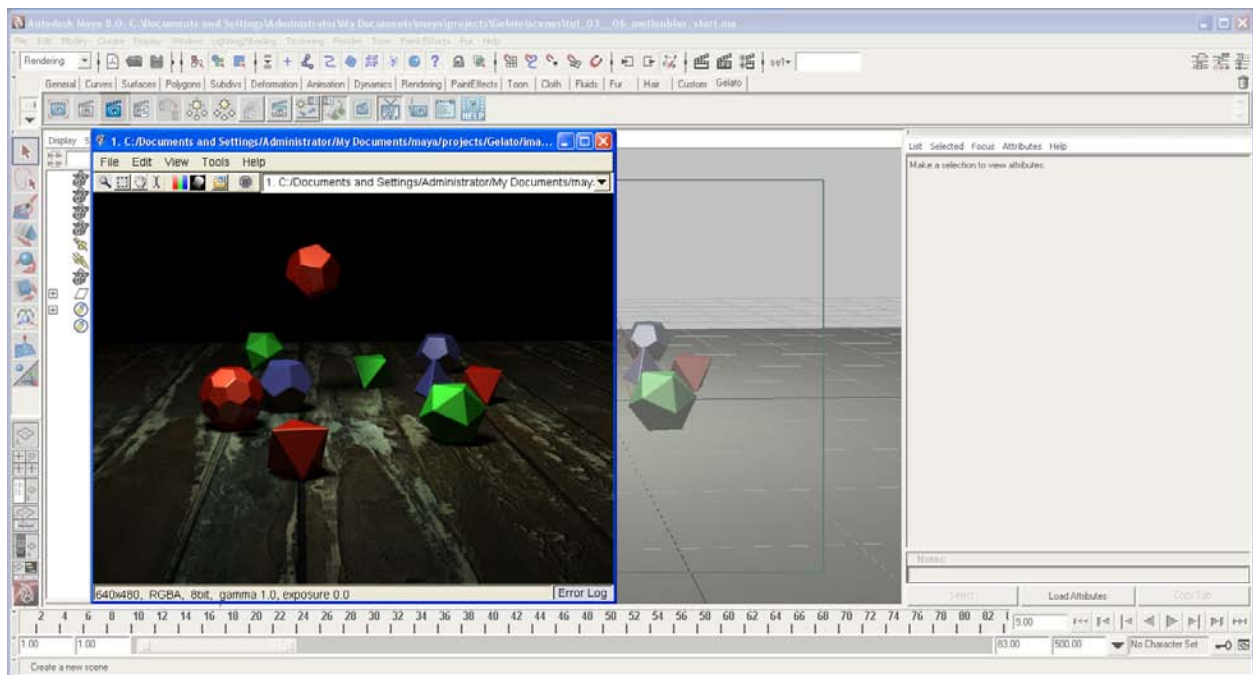
This is the companion to the movie, tut_03_06, part 6 of 8 NVIDIA® Gelato® Advanced Tutorials.

In this tutorial, we are going to delve into motion blur and depth of field. Gelato's motion blur is very fast. When there is a large scene using depth of field, motion blur, raytracing, etc., all at once, Gelato really shines. Where other renderers crash, Gelato can handle it well. This tutorial will show the basics of depth of field, then in tut_04_02, we'll really take it out for a spin when we use it with Sorbetto.



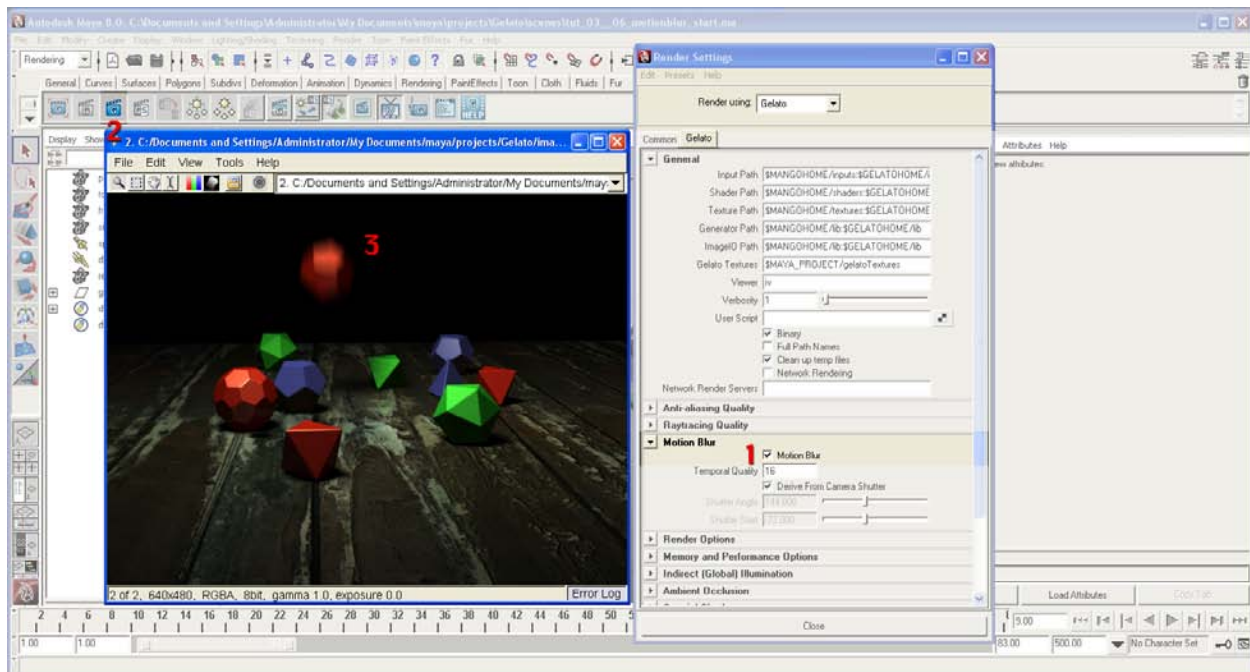
- Open “tut_03_06.”
- Scrub through the animation time line or hit **[Play]** to see that this is an animated scene. There is a dice being dropped down onto a surface with other objects around it.

A spotlight is acting as the key light and a directional light as being used as the fill light. Ray traced shadows have been enabled for the spotlight. *When doing shadow casting with motion blur, it's necessary to use ray tracing. Depth map shadows will not produce shadows during a motion blur render.*



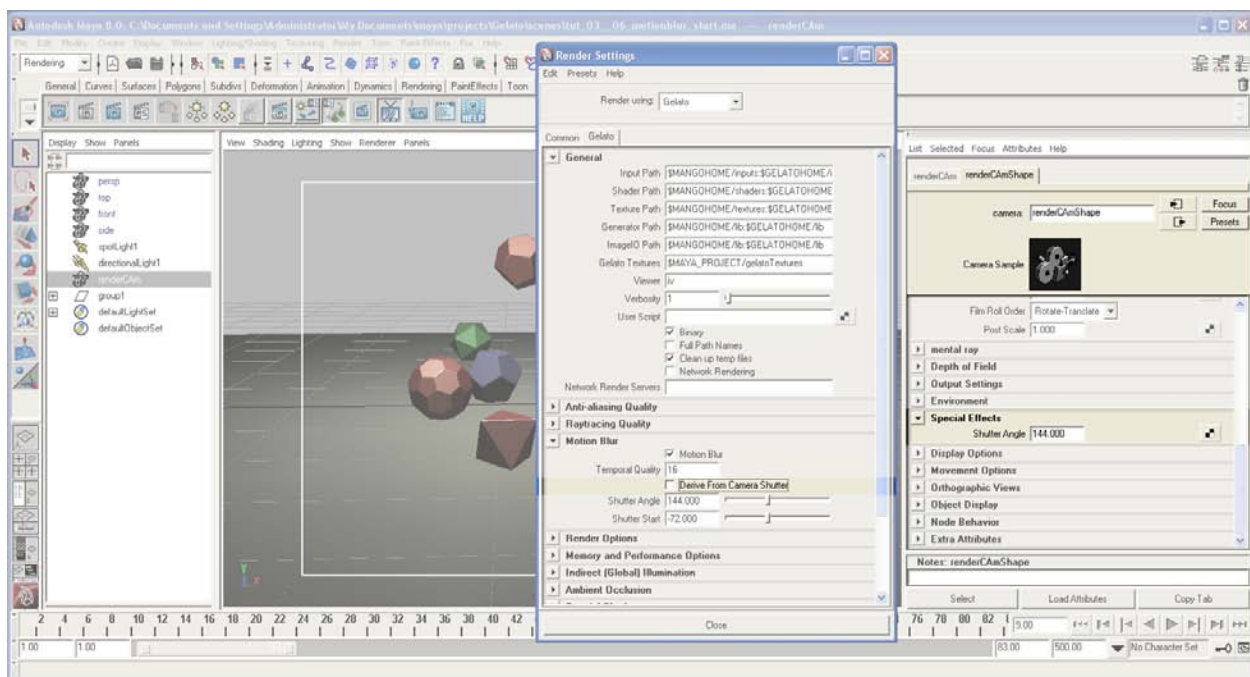
- Scrub to frame 9.
- Gelato render.

This shows us our scene without motion blur and is our starting point.



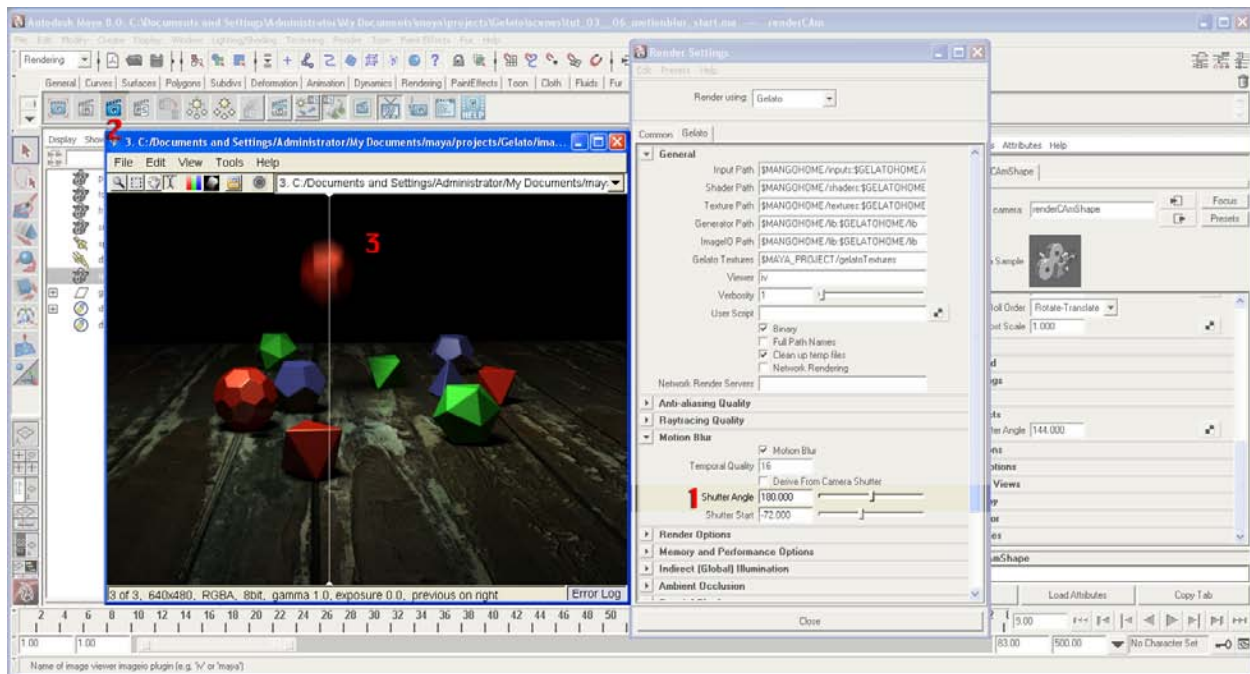
- Render Settings > Gelato > Motion Blur > enable Motion Blur.
- Gelato Render.
- Notice that the rendering hit for turning on the motion blur is minimal.

We now see motion blur on the moving object.



- Still in the Motion Blur settings, disable Derive from Camera Shutter.

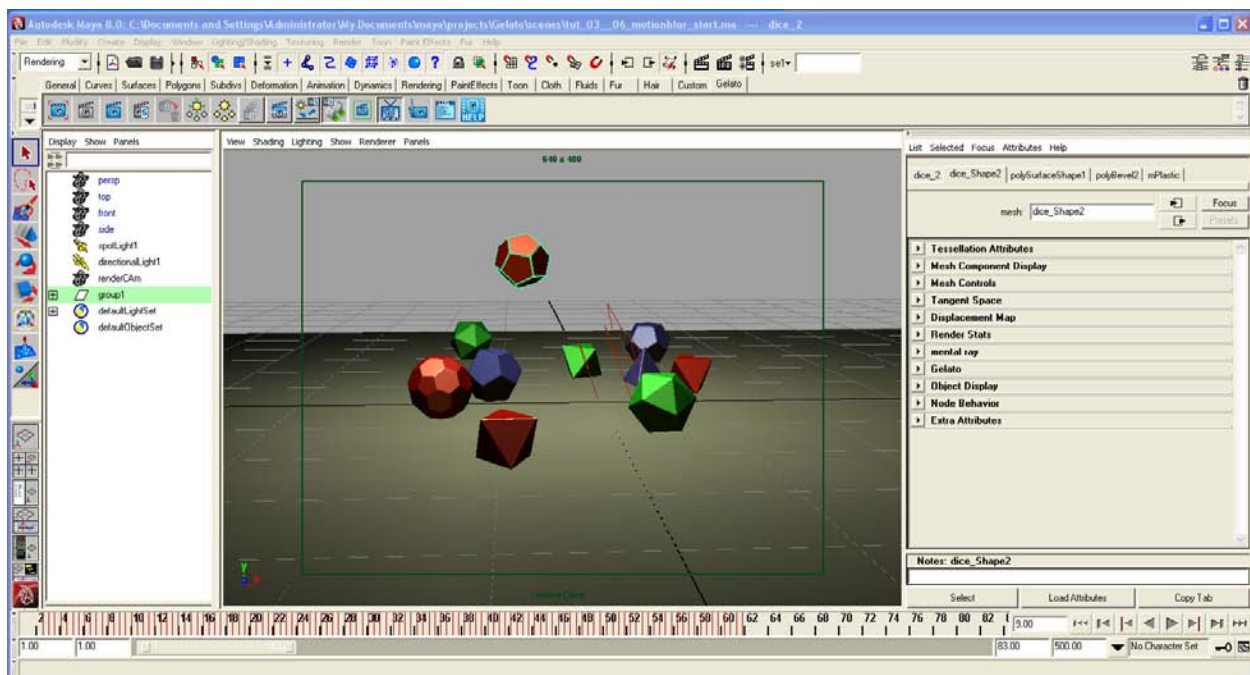
When Derive from Camera Shutter is enabled, it tells Gelato to use the Shutter Angle setting in the camera's attributes. Disabling this allows us to make our adjustments within the Render Settings dialog.



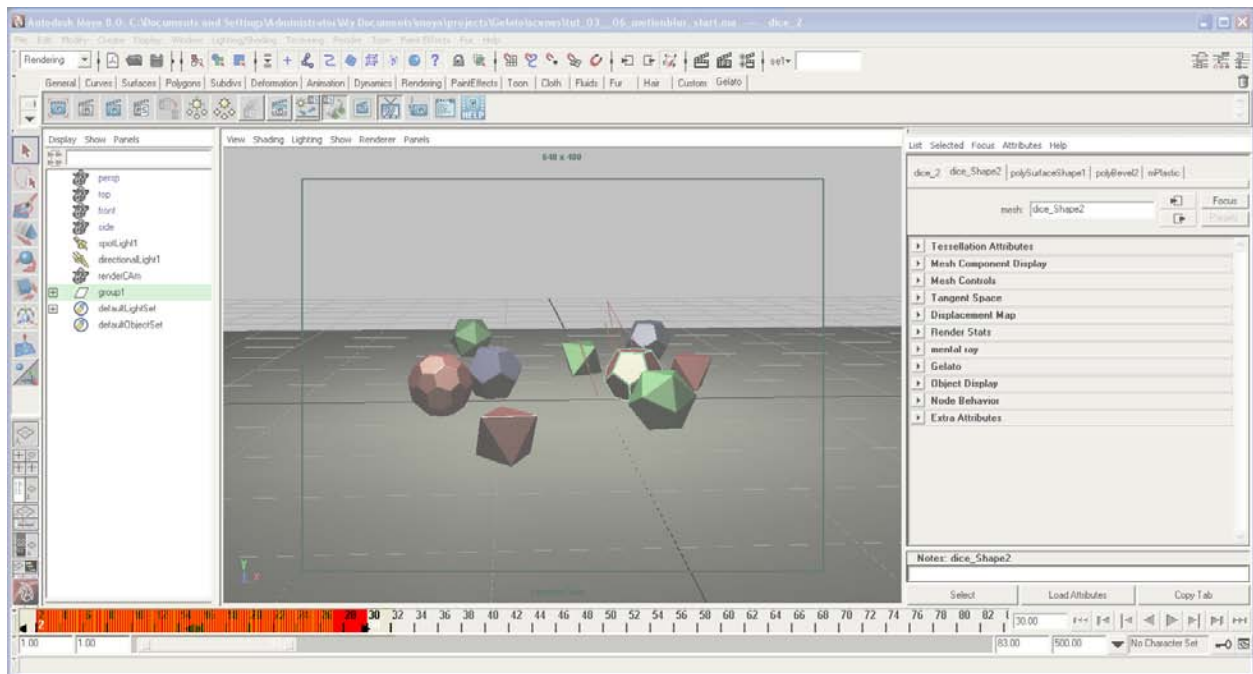
- Change the Shutter Angle in the Render Settings to 180.
- Gelato Render.
- Use the Wipe tool to compare this render to the last.

We now have more motion blur.

The shutter angle of a camera is what produces motion blur. A piece of film is held in a gate while the shutter rotates. The angle of the shutter is then going to determine the degree of motion blur – a larger shutter angle is going to have the piece of film in the gate for a longer period of time, resulting in more motion blur. 180 is a common shutter angle for many cameras, so this is what we are using here.

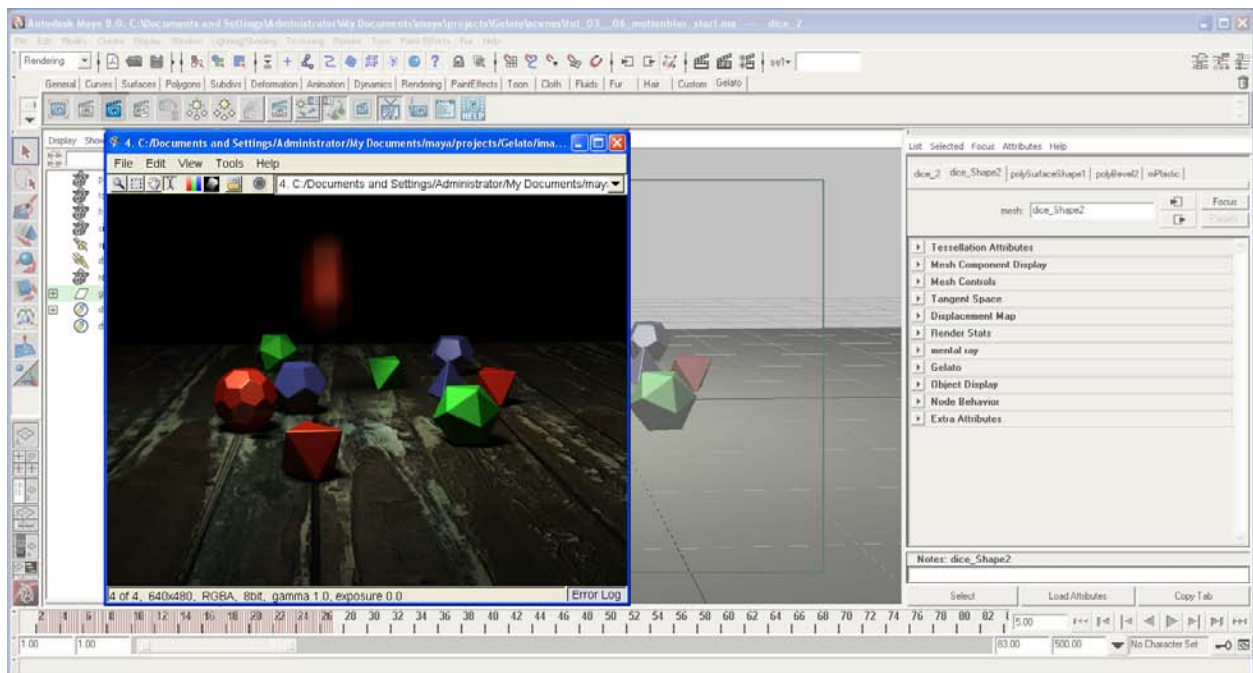


- Select the moving dice. Its keyframes will appear in the Time Line.



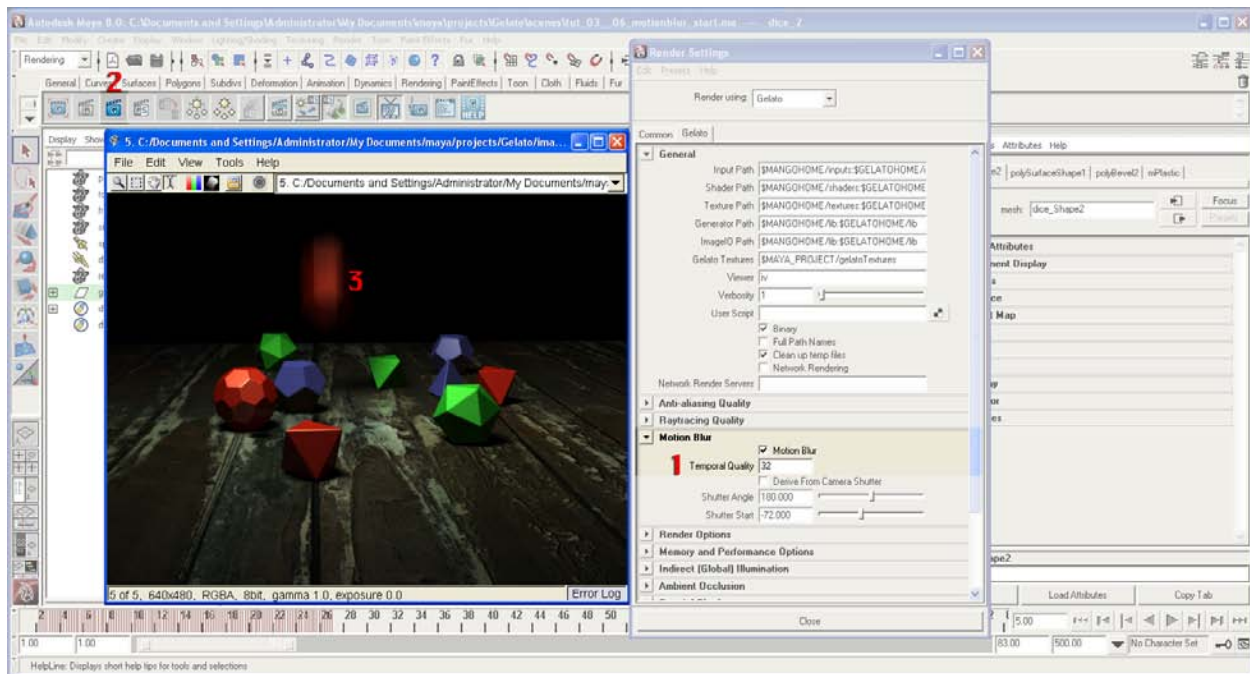
- Select the keyframes and compress the animation to about half its original length.
- **[PLAY]**.

The animation now plays twice as fast.



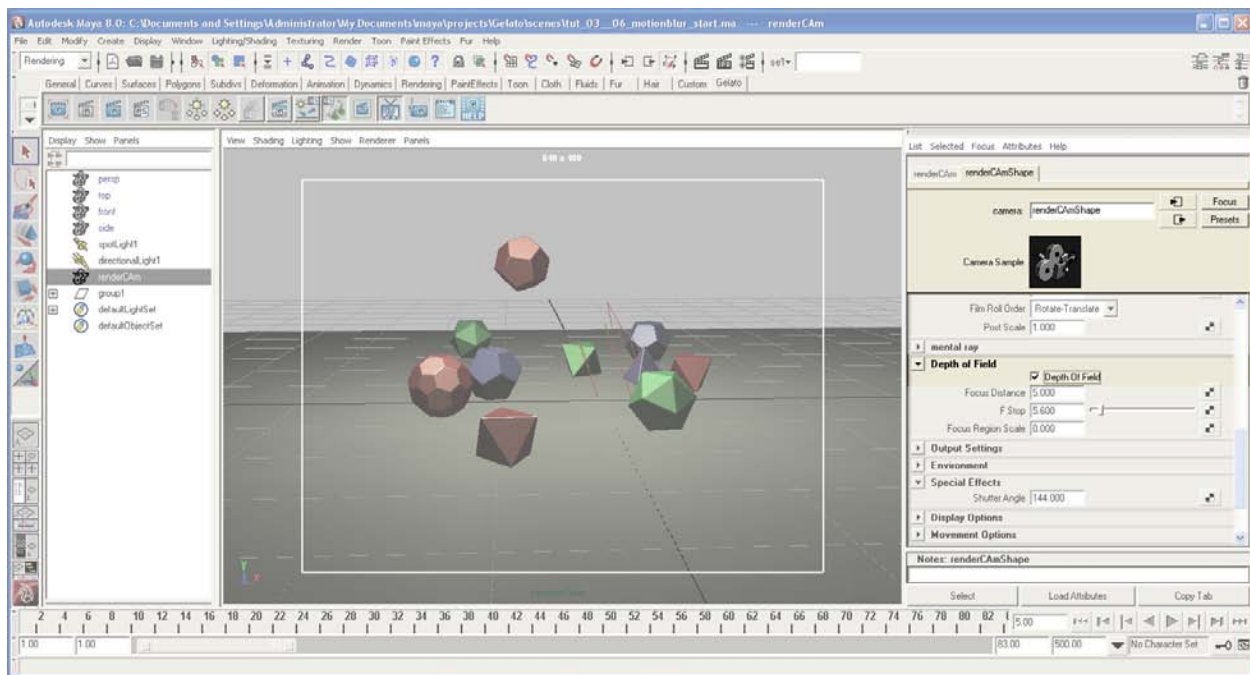
- Set the animation to frame 5, or whatever will give you the dice in its highest position.
- Gelato Render.

The dice is responding to the faster animation time – it's showing a lot of blur. It's also showing artifacting – a stuttering-looking effect.

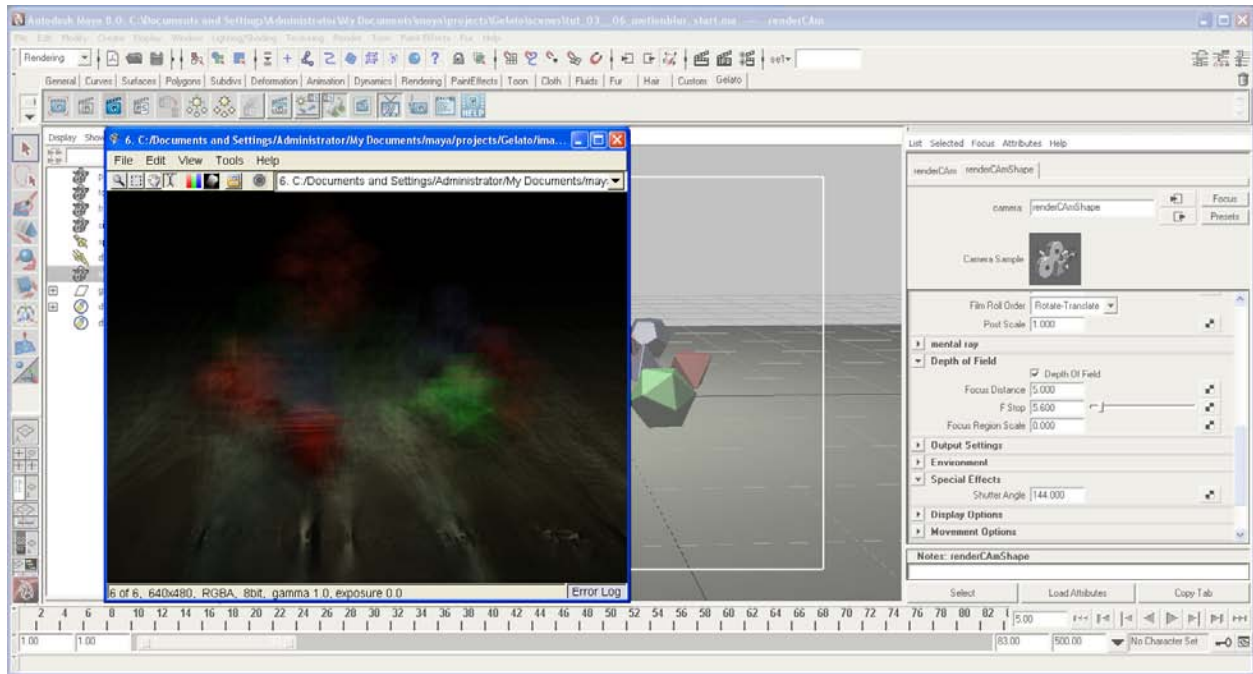


- Change the Temporal Quality to 32.
- Gelato Render.

We can see that the artifacts have now been removed. Let's now address depth of field...

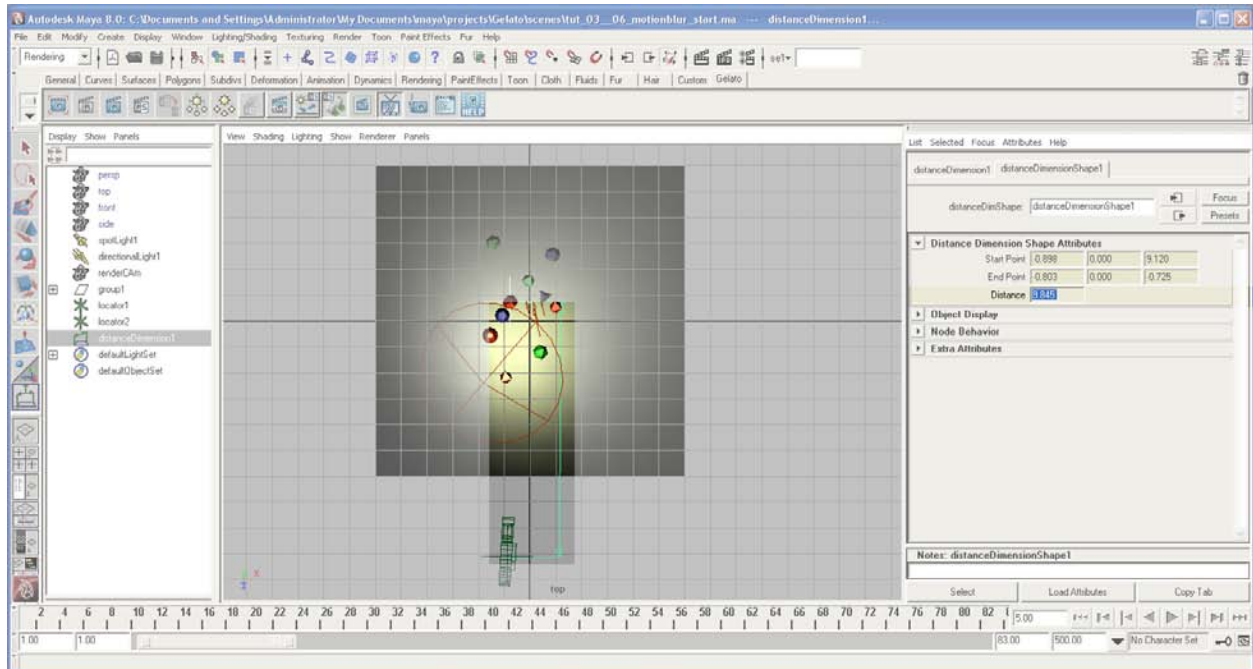


- renderCam's Attribute Editor > Depth of Field > enable Depth of Field.

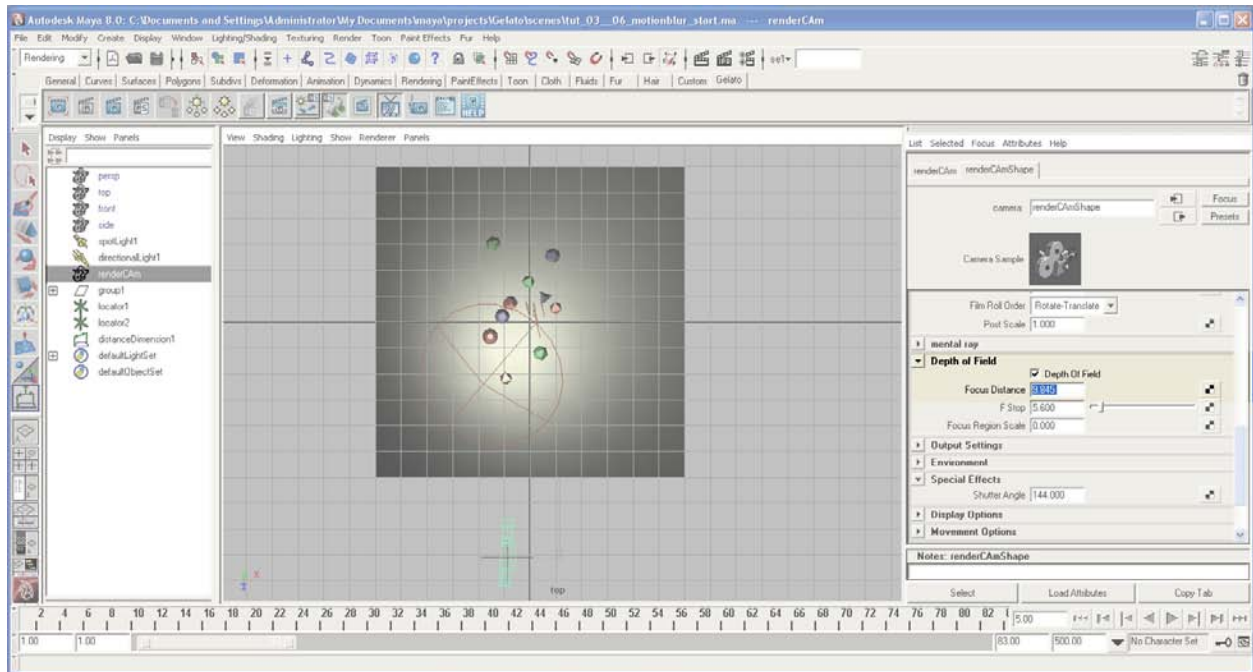


- Gelato Render.

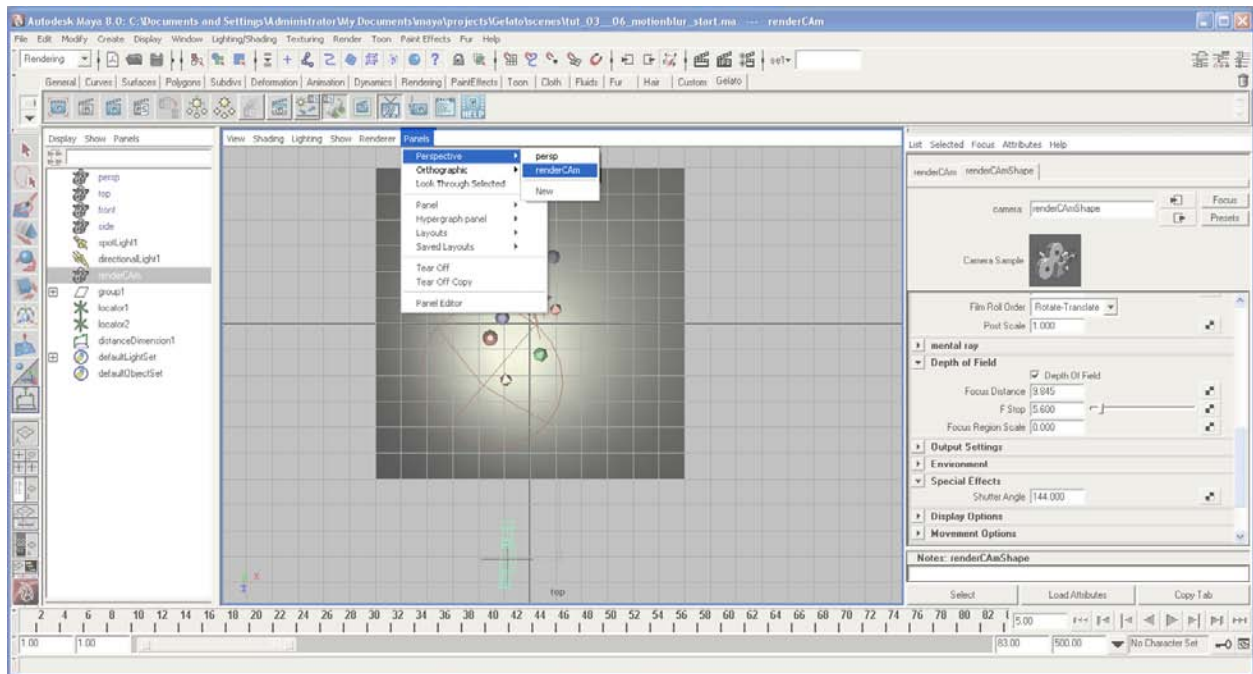
While interesting in an abstract sort of way, this is definitely not what we want to see. This artifacting has to do with the default Focus Distance and the distance we actually need to have for this particular scene. Let's take a measurement to find out where we need to move this value.



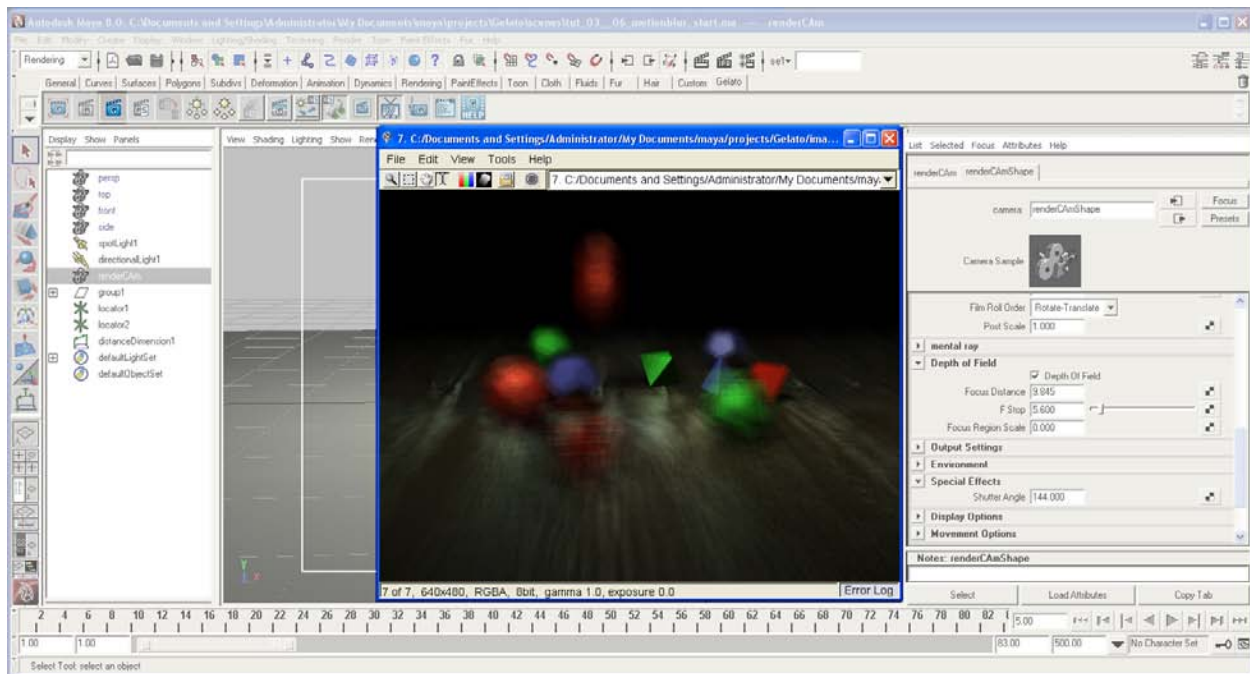
- Change to the Top view.
- Main Menu > Create > Measure Tools > Distance Tool.
- **[CLK]** on the middle of the camera, then on the moving dice.
- Distance Tool's Attribute Editor > Distance Dimension Shape Attributes > Distance > copy the value in this field.



- renderCam's Attribute Editor > Depth of Field > Focus Distance > paste into this field.

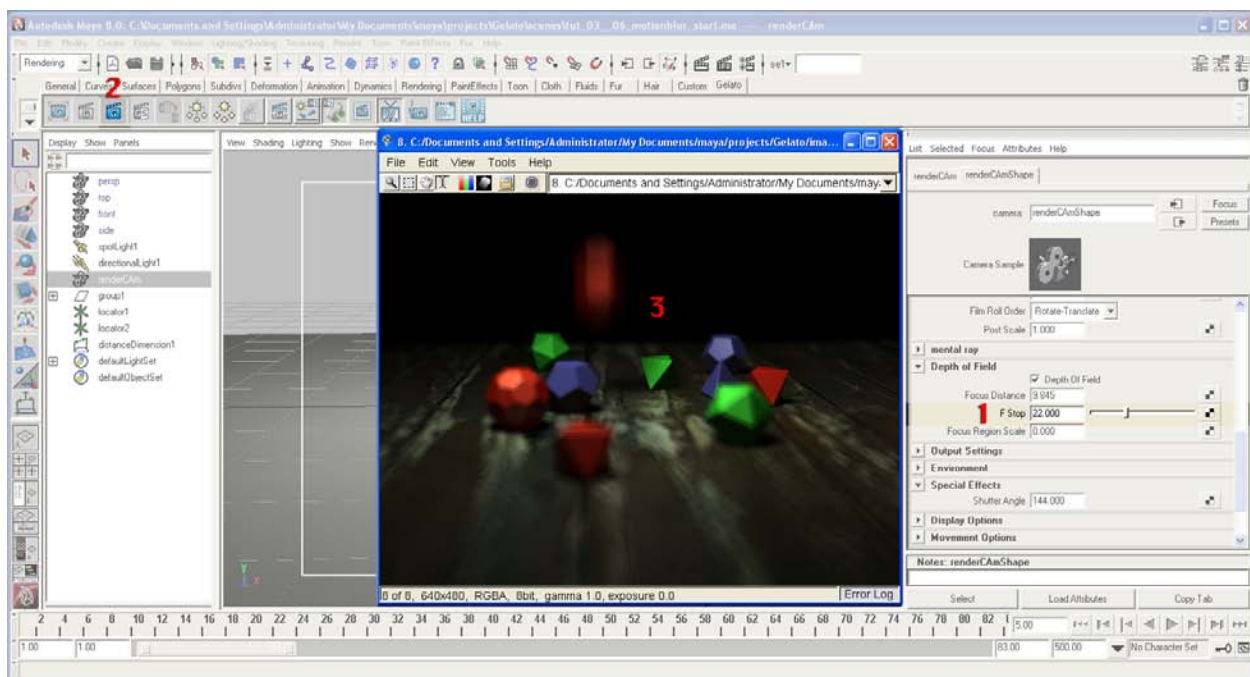


- Return to the perspective view.



- Gelato Render.

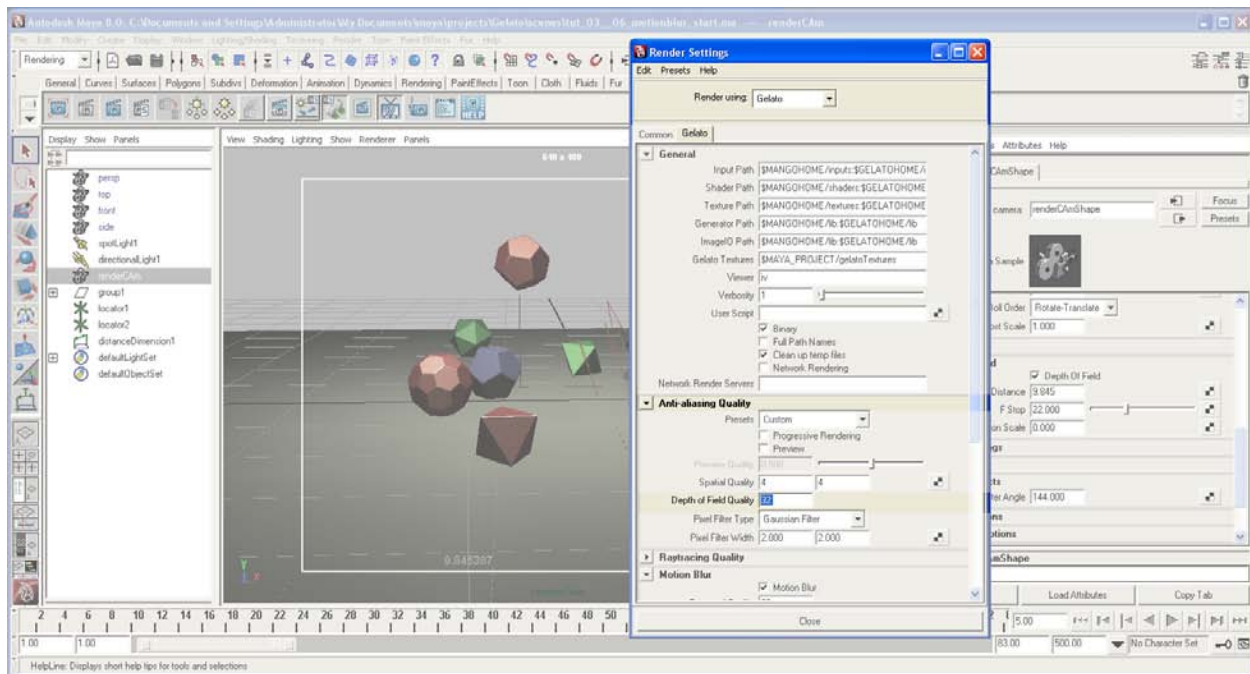
There is now a narrow area which is indeed in focus. To fix the range which does fall into focus, we need to adjust the F Stop.



- Change the F Stop to 22.
- Gelato Render.

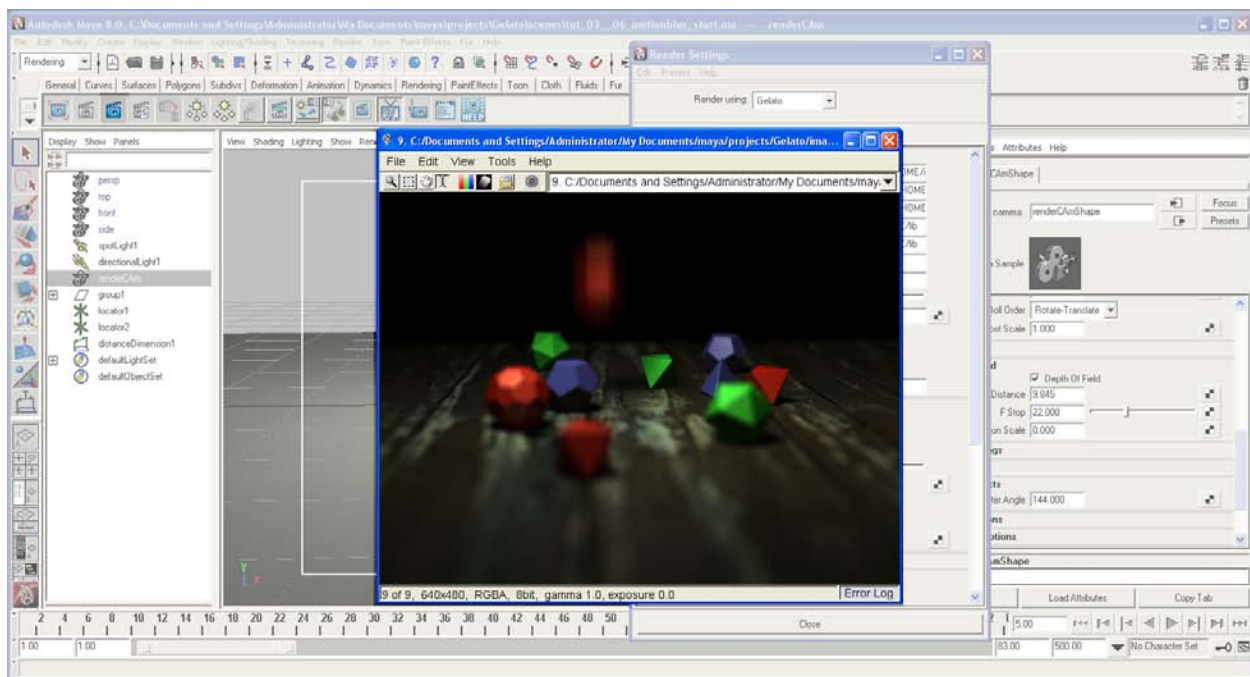
Better... Because the camera is so close to the objects, it's still not showing everything in front.

The Focus Region Scale, the remaining parameter in the Depth of Field section and which is used by Maya, is not currently supported in Gelato. This is a control to exaggerate the depth of field and is not physically accurate.



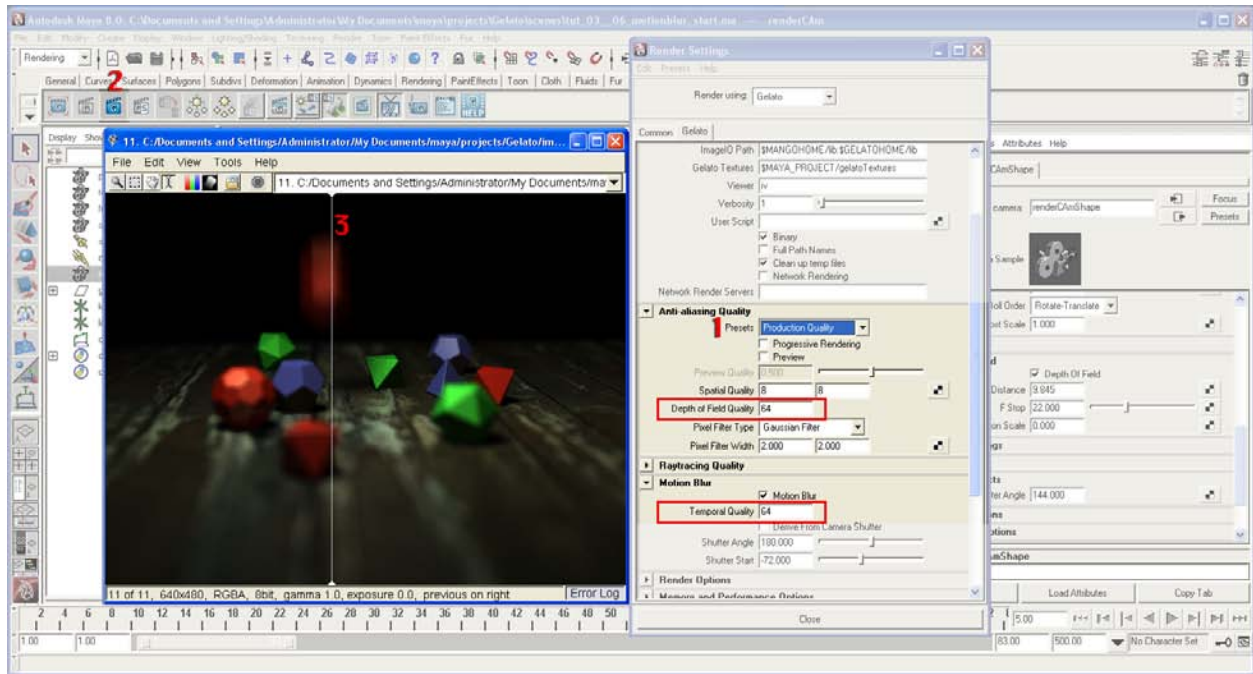
Let's now address the artifacting. It's particularly evident in the foreground red object.

- Render Settings > Gelato > Anti-aliasing Quality > Depth of Field Quality > change to 32.



- Gelato Render.
- Use the Wipe tool to compare this render with the last.

The artifacts in the back of the scene have been cleared up quite a bit; the front is better, but still needs some help.



- Render Settings > Gelato > Anti-aliasing Quality > Presets > change to Production Quality.
- Gelato Render.
- Use the Wipe Tool to compare this render to the last.

When we changed the Anti-aliasing Quality to Production Quality, both the Depth of Field Quality and the Temporal Quality values were bumped up to 64.

This render looks much nicer and concludes this tutorial. We will look at depth of field again in a later tutorial when we take an in-depth look at Sorbetto.