

Tutorial - Candle and candle flame using smoke simulation in Blender 2.5

This is a tutorial for intermediate level blender user. Here is a render of the candle's flame model we are going to do in this tutorial with Blender 2.5 using Physic's smoke simulation.



This tutorial is following the video tutorial from Blenderer Raub

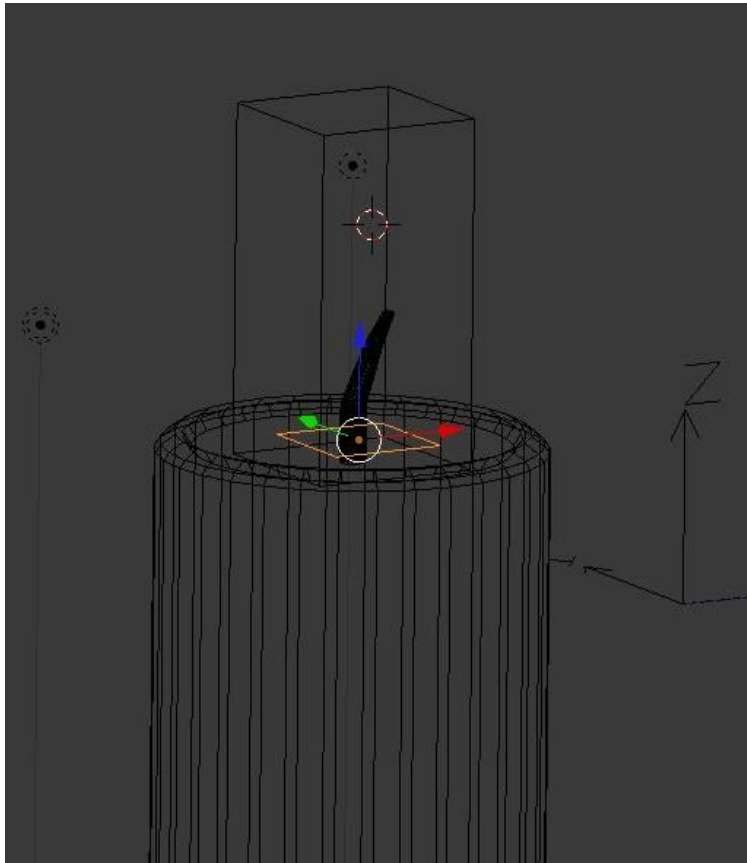
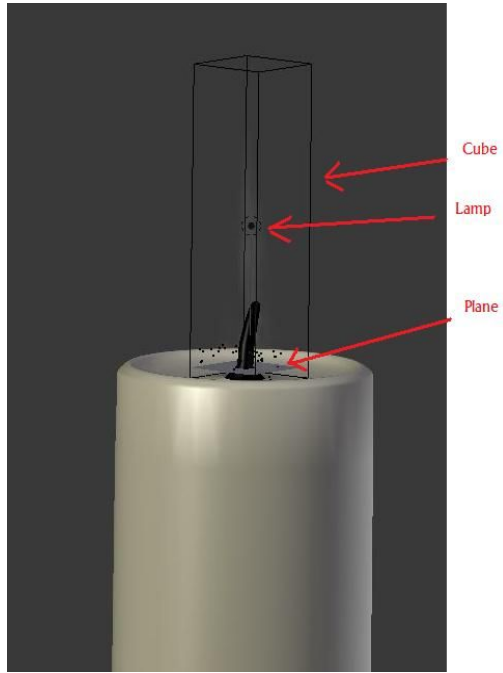
http://cg.tutsplus.com/tutorials/blender/3d_cg_tutorial_candle_flame_blender_2-5_volumetric_particle_render_lighting_1/

This tutorial makes a nicely looking candle's flame using the new 2.5 physic's smoke simulation.

Basic Scene

The whole scene contains the following objects:

- 1 - A cube for the flame simulation as the smoke Domain
- 2 - A plane as a particules emitter as the flow object for smoke simulation
- 3 - The Candle with a wick object
- 4 - A lamp in middle of the Flame (Cube)



We are not going to model in details the candle with the wick which is easy to do by any intermediate user.

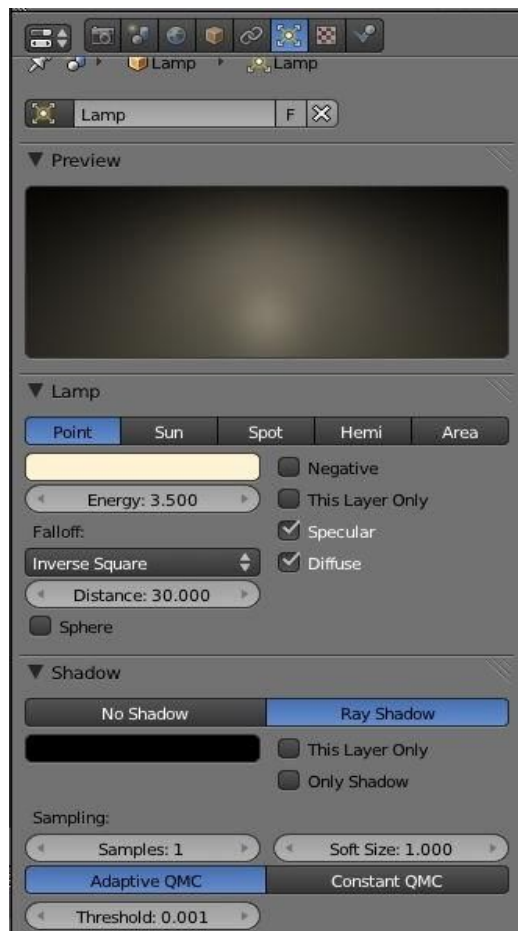
But let say that it contains 2 materials one for the wax with some SSS and one for the black wick
Also for the candle wax itself you need to set the receive transparent in Shadow sub panel.
You can also apply a subdivision modifier to the candle body to get really smooth corners.

Lamp in middle of the flame

Add a point lamp located above the flame as shown in ealier pictures.

set Energy at 3.5

set R = 1.0 , G = 0.897 and B = 0.660



Smoke simulation

Domain definition.

Now let's begin by specifying the Smoke simulation Domain.
In our case it is the cube on top of the candle

Note:

You need to scale the Cube in object mode only not in edit mode .

We first add material to this Cube as volume and 2 Voxel textures.

We use the physic Smoke simulation to make our the candle's flame so go to the physic panel with the cube selected and enable smoke then select the Domain field for the cube.

in material panel

set density = 0.0

Density Scale = 5.0

Emission = 40.0

Voxel Texture

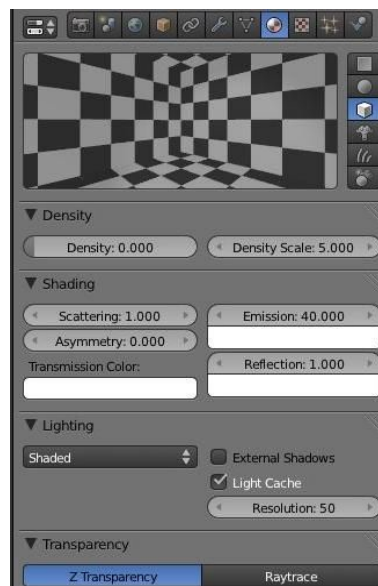
Now add a texture in texture panel

select Voxel Data and select the Cube as Domain object

in influence panel select Density and set = 1.0

Call it "Smoke"

Cube Domain Material

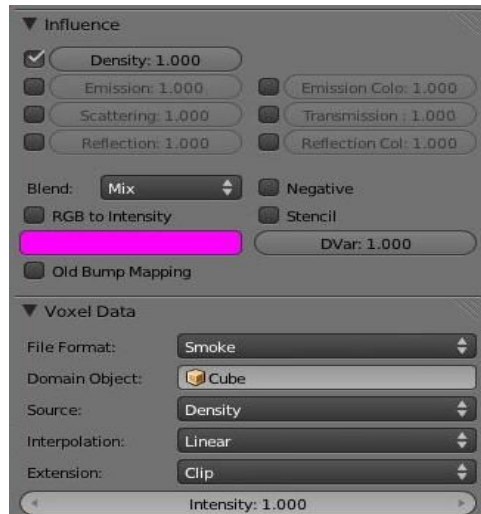


Cube Domain Textures

First Voxel Texture

Set the Density = 1.0 in Influence sub panel.

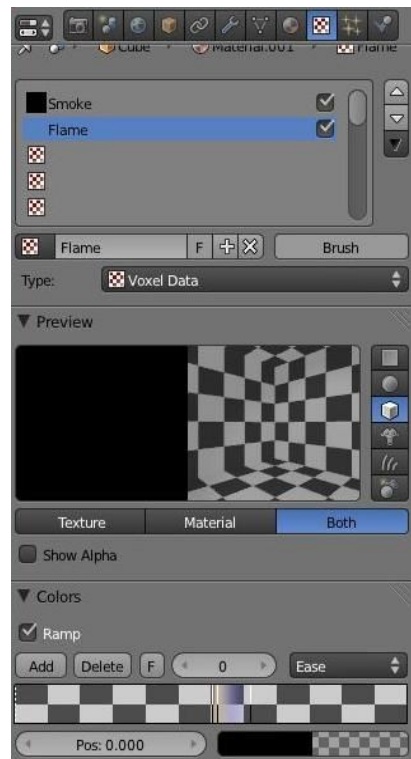
In Voxel data sub panel Set Domain Object as then Cube object.



Second Voxel Texture

Call it "Flame"

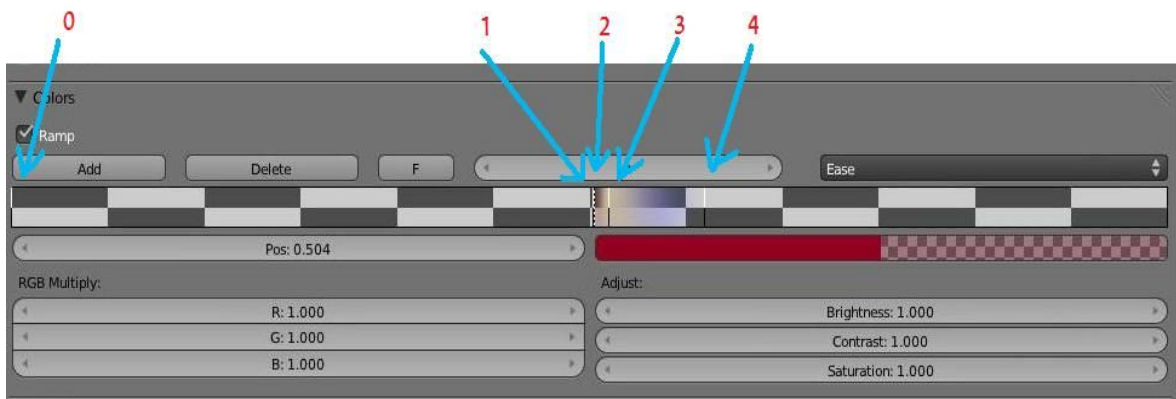
In Voxel data sub panel set the Source as Heat.



On the Flame texture Add a color Ramp with the following parameters

Color Ramp

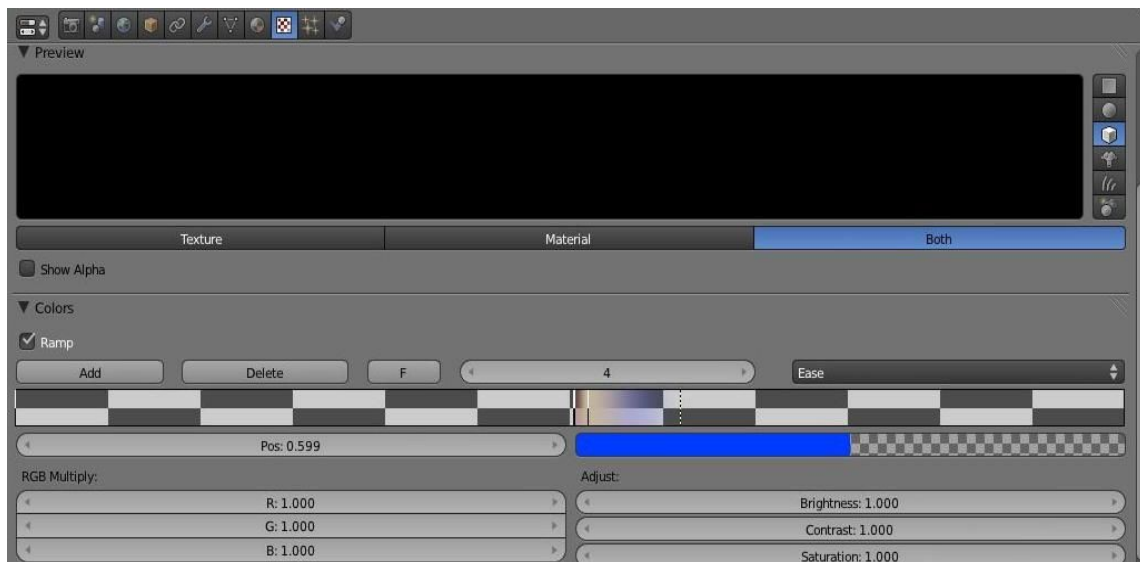
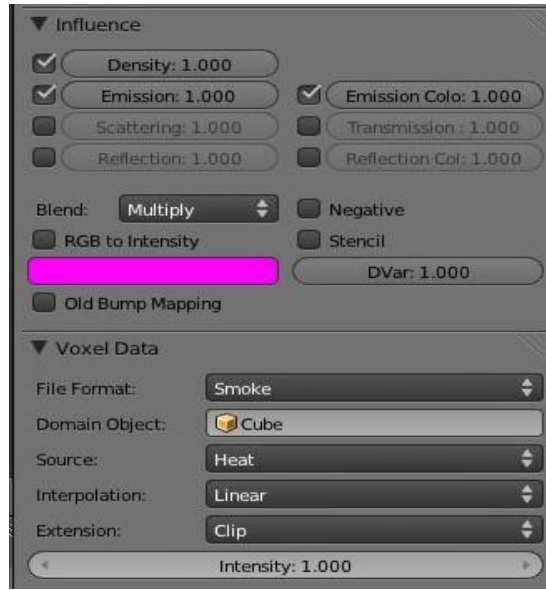
Ramp	Color	Color			Alpha	Brightness	Position
		R	G	B			
0	Black	0	0	0	0	0	0
1	Black	0	0	0	0	0	0.503
2	Red	0.297	0.000	0.000	0.250	0.500	0.504
3	Beige	0.554	0.469	0.332	1.000	0.800	0.516
4	Blue	0	0	1.000	0.100	1.000	0.599



set mixing mode as multiply

select Voxel Data and select the Cube as Domain object.

In influence panel set Density =1.0 , set Emission Color = 1.0 and set Emission =1.0.



Warning

In order to change some of the particles or Physic values you need to free the bake in particles system panel and redo the Bake dynamic again to get a new bake of your animation. Ounce the bake is done the particules system is not available anymore (Like all buttons are whitish in the particules panel) you need to free the bake to get access to the particules system!

Physic panel select Smoke



You also can add a name for the file called “low” with Start frame = 1 and End frame = 250.

Plane Emitter

Add a plane as shown in first picture to act as a particles emitter.

Go to the Particules panel and add a new particule system.

Set following parameters:

Amount = 50 000

Lifetime = 100

Start frame = 1

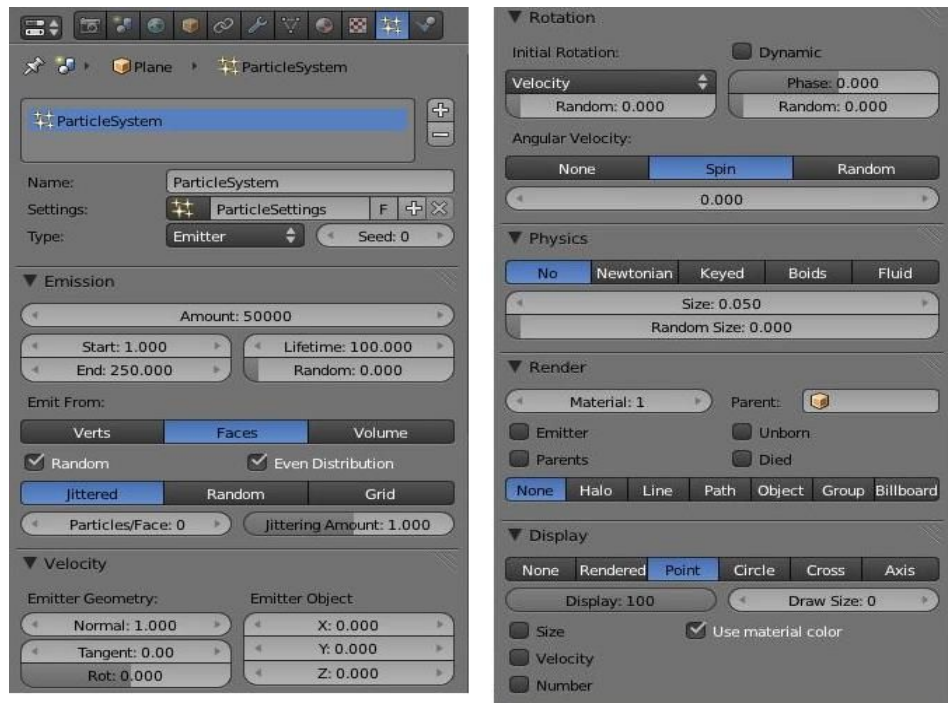
End frame = 250

Physic = none

Angle velocity = none

Render = none

Display = Point



In physics panel add Smoke and set it as Flow and select the particles system for the plane.

add the physic smoke and set it to flow and set the density = 0.2
with Domain still selected add in smoke cache frame = 250 and then Baked all dynamics.

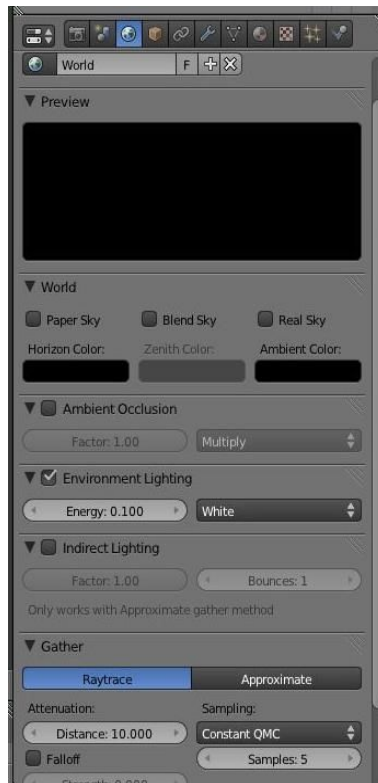
For the wick you can select a loop and then Ctrl Numpad + to select all the vertices on the wick.

Fly camera

If you dont have a camera constraint like an empty you can use Shift-F to move the camera in view port when in camera screen mode.

Scene general settings

Change the Horizon to Black color in Scene Panel then add some environment with energy set at 0.1 and change mode to multiply instead of add.



Rendering

General render window settings.

Adjust the camera to fit the minimum part of the candle and the flame above it may with a little angle
Adjust the dimensions of the render window.

You can set the render quality by adjusting some of the variables :

Problem for rendering :

If you did a bake in a folder then move this folder to another newer built when you render the flame may not appear !

To solve this problem you need to select the cube or Domain then go to the Physic panel and in the Sub panel External click on the "Free all Bake " then click on Bake all Dynamic again to redo the baking files then you can render and it should show the flame again in render window.

Low quality render

in Render panel set the following parameters:

Sub panel Anti-Aliasing to the minimum = 5.0.

In the Physic panel you can adjust the Resolution Division and the Strenght to have a lower quality and

resolution.

For low Resolution adjust the Strength around 2.

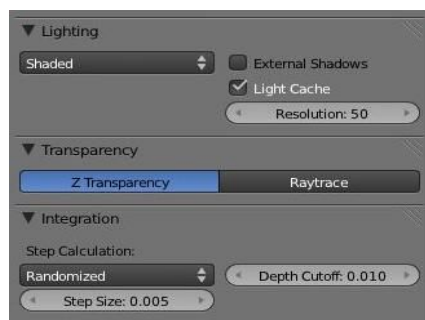
High quality render

in Render panel set the following parameters:

Sub panel Anti-Aliasing to the minimum = 16.

For High Resolution adjust the Strength around 0.1.

in material panel for the “cube” go down to the integration panel and set the step size = 0.005



For the Domain Bake

The strength value defines how strong the effect of the wavelets is. The number of hires-divisions defines the sharpness and how long the processing takes. So in this example the strength is set to a very low level because we only wanted the sharpness.

Note:

You can find other tutorials on physics simulation at Raub's internet site at

http://cg.tutsplus.com/tutorials/blender/3d_cg_tutorial_candle_flame_blender_2-5_volumetric_particle_render_lighting_1/

This PDF tutorial was made by following the video tutorial from Raub on Blenderartist.org forum.

Tutorial by Rickyblender on BlenderArtist.org

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