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I n t r o d u c t i o n

Modelling a fire is an unavoidable step in one's tridimensional artist career. Most of the time, you don't even notice it when it's time... you become curious and you stop trying to model cups of coffee in order to pay a look to Particles systems. You then realize that you are no more a newbie but, somewhat, some sort of a an initiate. Your skill has matured, and you show more insight in the building of new scenes.Time has come to learn even further. But enough with this low level philosophy ! You are here to read a quick and efficient turorial about Particles. The purpose is easily set : we'll make a good old campfire !

As you will see, the method is very easy and straightforward, and should not prove difficult now that you masters most of the basics of Blender. First of all, we will create a mesh that will become our particles emitter. Its material will be turned into a Halo, to which a procedural marble texture will be associated, with carefully chosen colors... A few texture parameters setting later, our fire will be completed ! Doesn't seem difficult, right ? So get into you fireproof pants and go one !

Important note : during the turorials about animation of fire and smoke with Blender, you should remember that the particles systems don't always have the expected behavior in the close vicinity of the emitter. For this reason, we suggest you to build your scenes in order to have your emitter away under the floor, for example. Anyway, you will see by yourself, while making your first renderings with this tutorials, what's wrong if you keep the emitter exactly facing the camera. Happy blendering !

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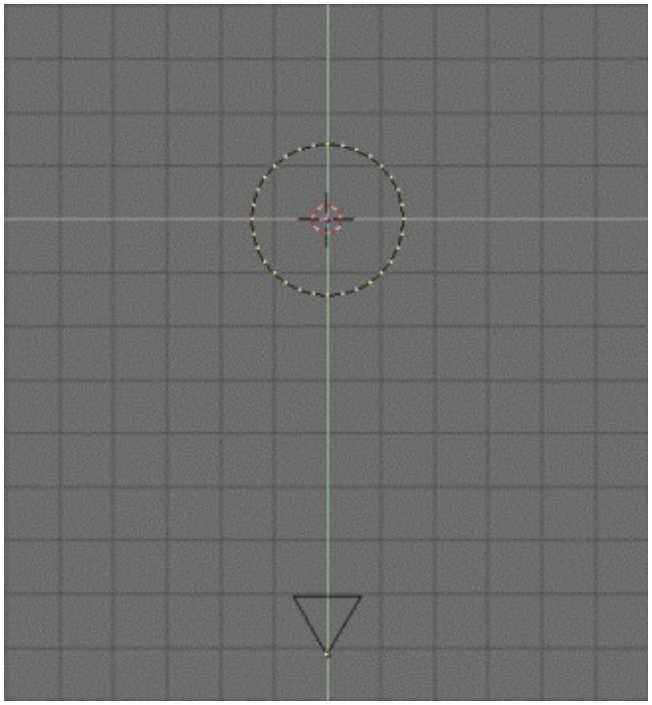
S t e p 1 :

Please start with opening a new session (**CTRL+X**) and erase the default plane (**X−KEY**). We are about to create the emitter of our particles system. For a small campfire without specific shape, a **circle** will be enough (**BARSPACE>ADD>Mesh>Circle**). For a more specific fire, just like a candle or a welding−torch, you would prefer to start on the basis of a UVSphere (**BARSPACE>ADD>Mesh>UVSphere**), perhaps slightly stretched in the case of the welding−torch. In fact, any mesh with more than three or four vertices could do the job, in theory... I'll start here on the basis of a circle, but nothing else is different in the other steps of this tutorial. Once the object is created, you can leave the edit mode (**TAB−KEY**) and move it anywhere you want (I voluntary left it right in front of the camera).



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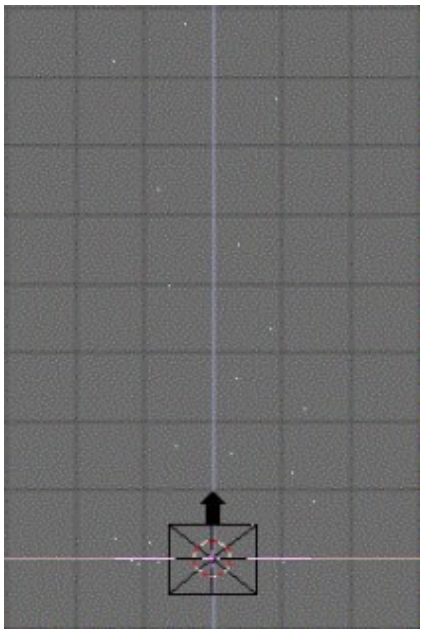
S t e p 2 :

Call the Animation effects buttons with the **F7−KEY** or click on the  animation button. Click once on the  button, then on the  button and hold to have the time to select the **Particles** effect. You should see the now familiar following buttons.

In the Display buttons (**F10−KEY**), we see that Blender renders its animation on a default frame rate of **25 Frames/s**. We will set a 10s animation (which represents 250 **Frames**). For a small campfire, you don't need more than 200 particules. For a candle, you can do away with a dozen particles, while a raging inferno can ask up to (and even more) 1000 particles. We'll keep reasonnable and set **Tot: 200**, which will insure both a low memory load and a fairly quick rendering time :o). Remember that we are making an animation. If you keep the default **Sta: 1.00**, your fire will be born before your very eyes and will burn at its full strength around the end of your animation. Perhaps it's an effect you could be looking for, but it is not the case of this tutorial. Set **Sta: −250.00** to see it burning at full strength from the very first frame of your animation. Of course, set **End: 250.00** because there is no interest in letting it burn longer than your animation lasts. **Life** is the lifetime of your particles. Any value between 50−100 should be good enough. Try the middle value, so please set **Life: 75.00**. As you don't want to render a gigantic explosion, try to constrain **Rand** to a value between 0.01 and 0.05. Beware, results can quickly become spectacular ! You should better, for the second time, try the middle value : **Rand: 0.025**. For now, our flames are rather lazy, but you would like them to dance up to the ceil ! You can master the heigth of your fire with the **Force Z** button. Try different values, according to the size of your fire, but you can always try 0.1 or 0.2 because it is not a fire column you intend to model. If doubtful, do as before and try the middle value : **Force Z: 0.150**.

Go to front view (**NUM−1**). Review the way your particles animate by pressing **ALT+A** (**ESC** to stop the animation). You should note that the emitter spits its particles in a much too sorted way to seems natural. We will fix this by editing (**TAB**) our emitter, by selecting all its vertices (**A−KEY**) and by going into the edit buttons (**F9−KEY**). Then find the 

button and click on it. Here we are, the particles will now be emitted in a more chaotic way ! You can check this by pressing again **ALT+A**.

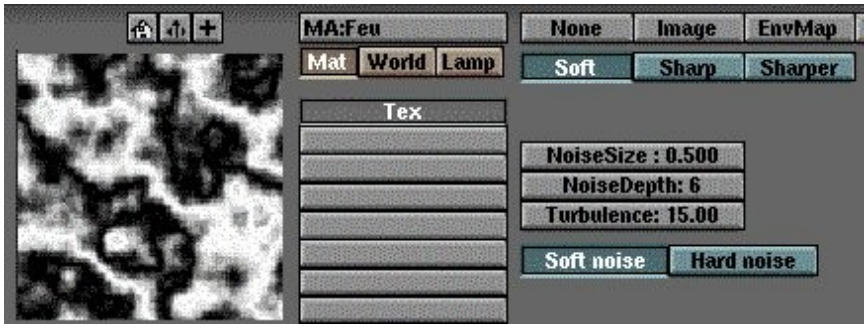


S t e p 3 :

For now, you have a pretty particles system, but you need lots of imagination to see here a fire. We will fix it right away ! Please invoke the Material Buttons (**F4−KEY** or). With your emitter selected, add a new material (**ADD NEW**) by clicking ont the button. Turn your physical particles system in a halo system by activating the Halo button. The material parameters change slightly. Take time to turn on the new HaloTex button, because it will be useful during the following step : the halo is now ready to host the texture that will achieve the illusion of real flames. But before this is done, let's set the parameters of the Halo. Enters the following values for the three colors R, G and B : **R 0.600**, **G 0.255** and **B 0.000**. You should get a warm orange, but it is still insufficient to render illusion of true flames.

S t e p 4 :

We will add rigth away a texture to our fire, and set the many parameters to get, at last, a realistic looking fire. please call the Texture Buttons (**F6−KEY** or ) and add a new texture (**ADD NEW**) by clicking on the  button. A row of texture types then appears. Choose the  button to access the marble texture parameters. Try the following values : **NoiseSize : 0.500**, **NoiseDepth : 6** and **Turbulence : 15.00**. Perfect !



Please go back into the Material Buttons (**F4−KEY** or ) in order to tune our parameters. The new texture shows hideous pink stripes, which is Blender's default secondary color. Our first move will be to change the R, G and B sliders values in the area devoted to textures parameters, on the right. Choose **R: 1.000**, **G: 1.000** and **B: 0.600** to get a lovely yellow that will enhance the orange colour of the Halo. We are almost at a end ! We will now stretch the texture in order to have our true fire texture ! Set **SizeY: 0.300**. Always in the area devoted to the texture parameters, turn on the  button to let Blender transfer to the material the transparency settings of the texture. Only one step left to have our great fire !

Each particle will be given a Halo and we have to define its size. Set the parameter **HaloSize: 4.00** and render the first picture of your animation (**F12**) to check the result and move the emitter up or down accordingly, if you wish. What a lovely fire ! We should associate it a good smoke effect for the illusion to be perfect.