

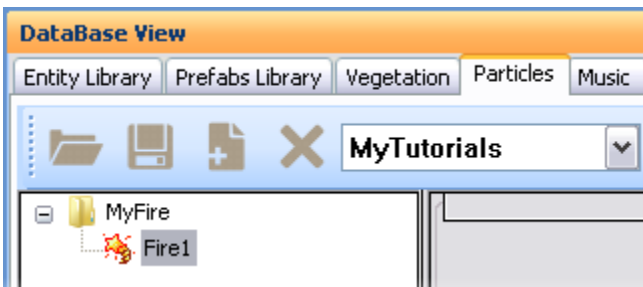
## Overview

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## Initial Setup

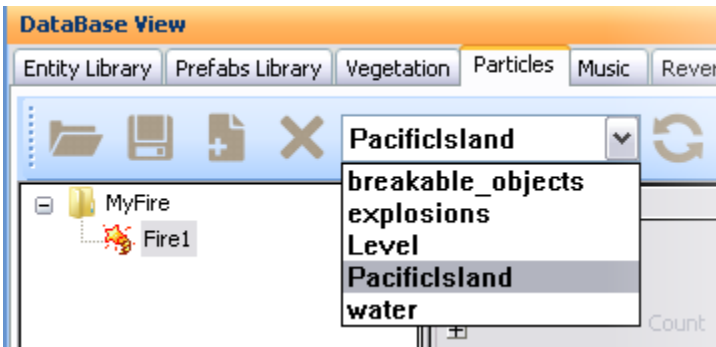
### Loading and Using Other Libraries

Click the **Load Library** button at left top of the **Database View**.



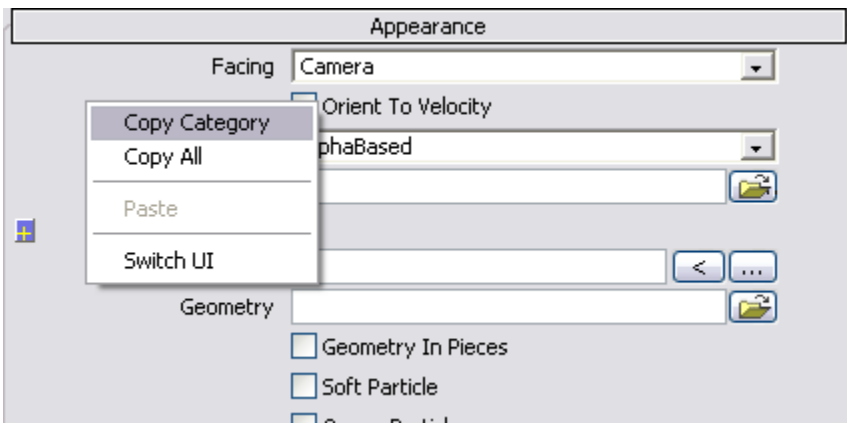
A browser window will open, from which you can select a different library.

You can switch between libraries by selecting them from the library drop-down menu.



### Copying and Pasting Particle Attributes

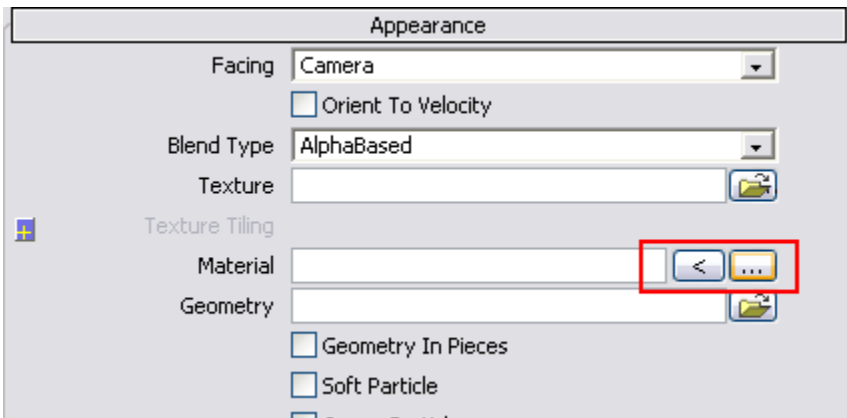
You can copy and paste between libraries by right-clicking within the pane and selecting either **Copy Category** or **Copy All**.



You can **Paste** using the same menu.

## Applying a Material to a Particle

You can apply materials to the particle. For example, if you select a refractive material, it will apply refraction to your particle.



Clicking the **Browse Material** button will open the **Material Editor**. Select a material from there, then go back to your particle in the database view. Now, click **Assign Material**.

## A Simple Particle Fireworks

This tutorial will teach how to create a simple fireworks effect using particles. It covers usage of second generation child particles and requires you to have at least read and understood the previous fire tutorial.

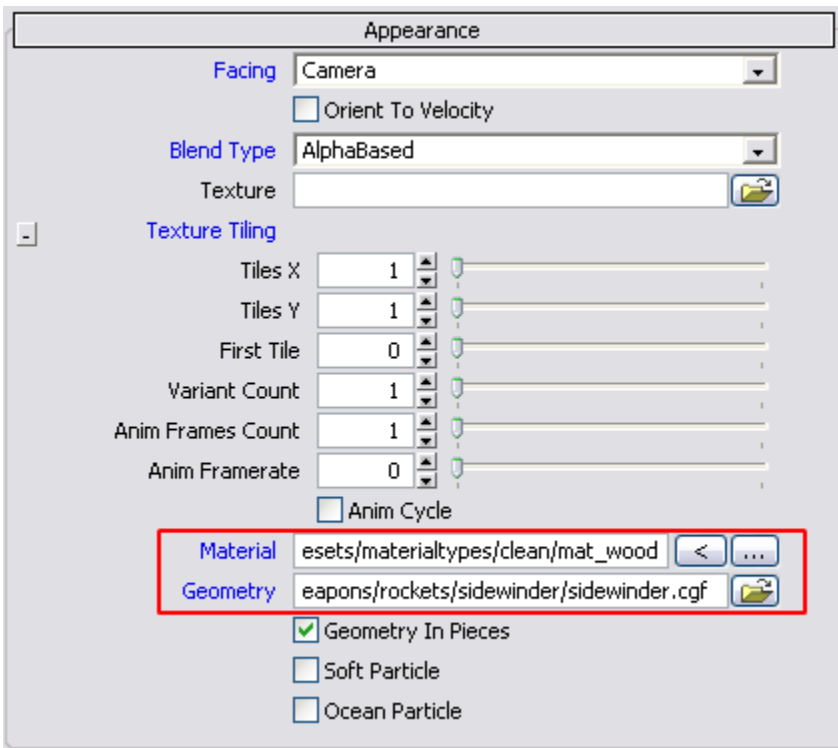
### Creating the Rocket

In the **DataBase View**, create a new particle item **Firework1** in the group **Fireworks**. This will be the fireworks rocket soaring up into the sky.

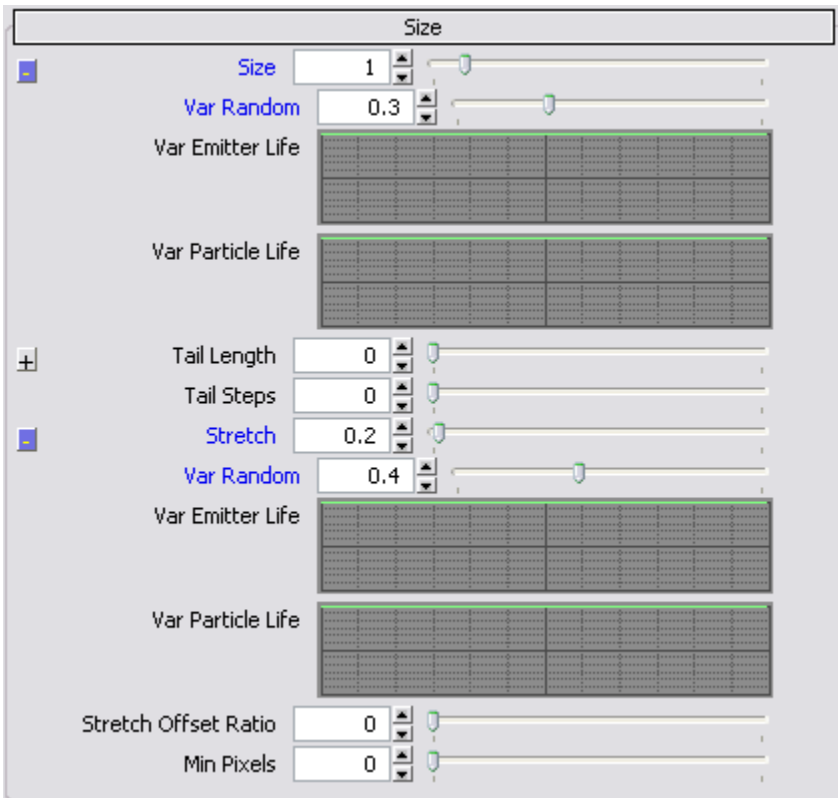
Set some basic information like particle count and life time. (Preferably choose some small values to be able to see one firework after another).

In the **appearance pane**, select a geometry and a material for the rocket, e.g. `objects\weapons\rockets\sidewinder\sidewinder.cgf` and `Materials\presets\materialtypes\clean\mat_wood`.

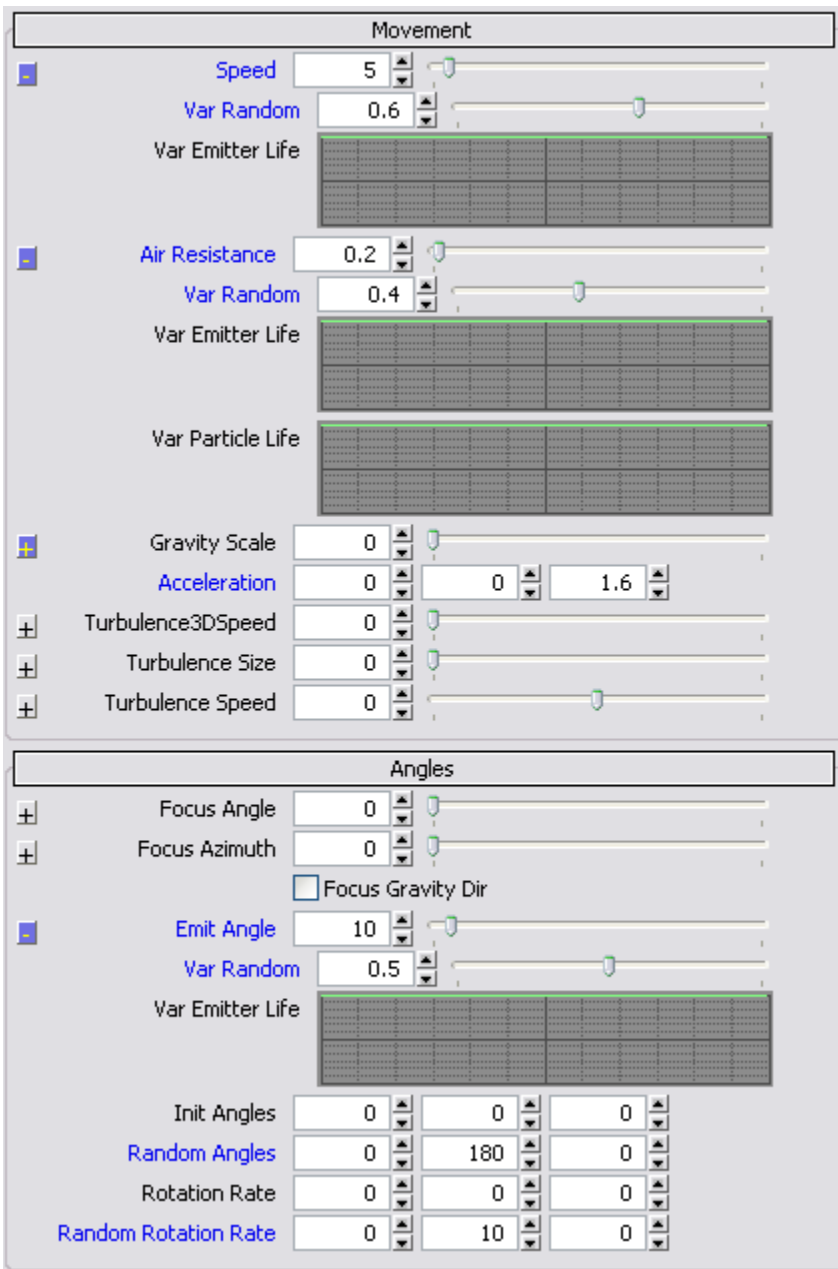
The rocket will not fade away, so the basic lighting settings should be just fine.



You can add some little randomization to its size or stretched length.



In the **movement** pane, set **speed**, **air resistance** and **acceleration** to your liking. Speed should not be set too high if you wish to actually see your effect. Also set the **emit angle** in the **angles** pane.

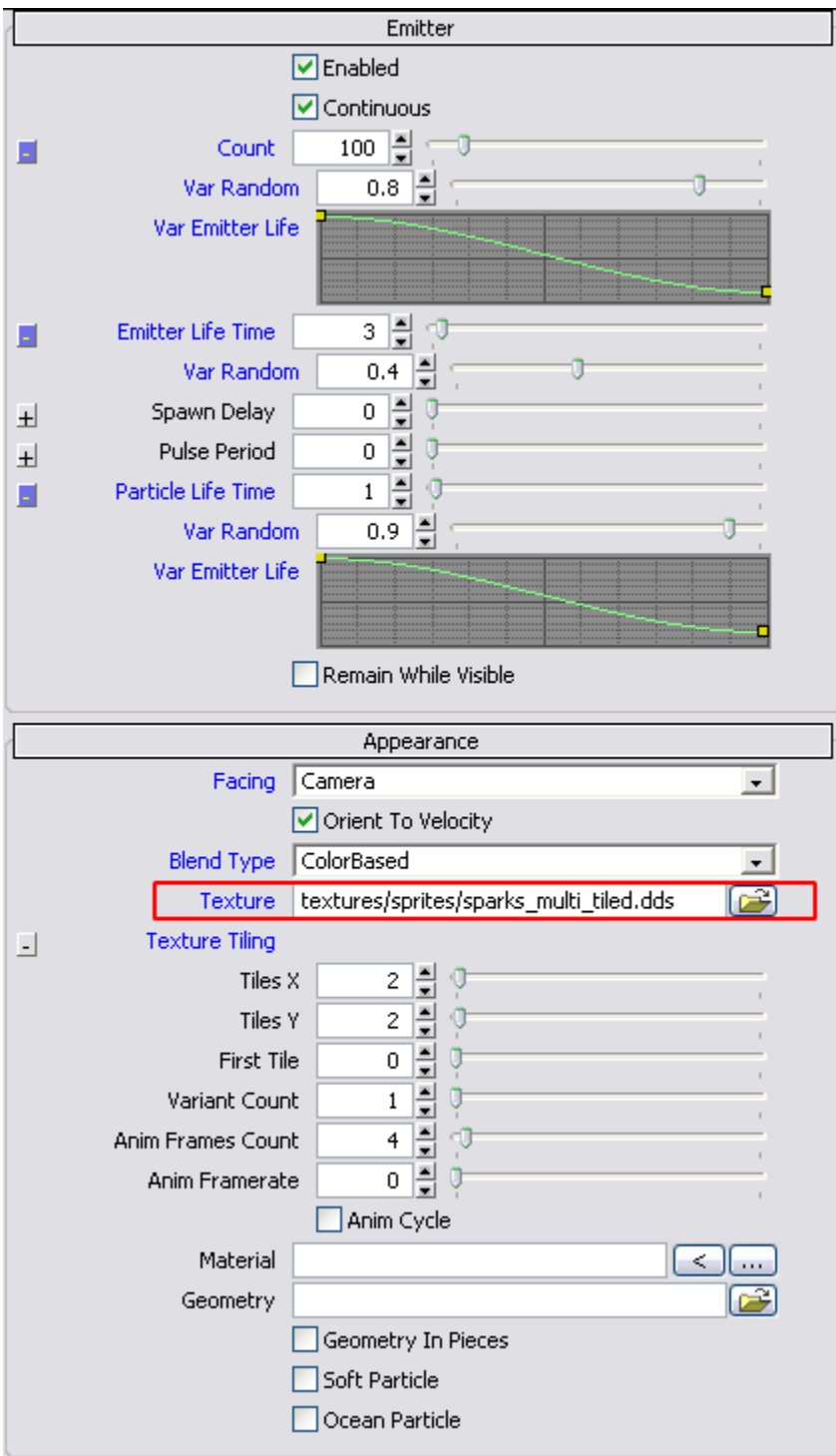


Now place the effect somewhere on your map and have look at the soaring rockets.

## Adding Trailing Sparks

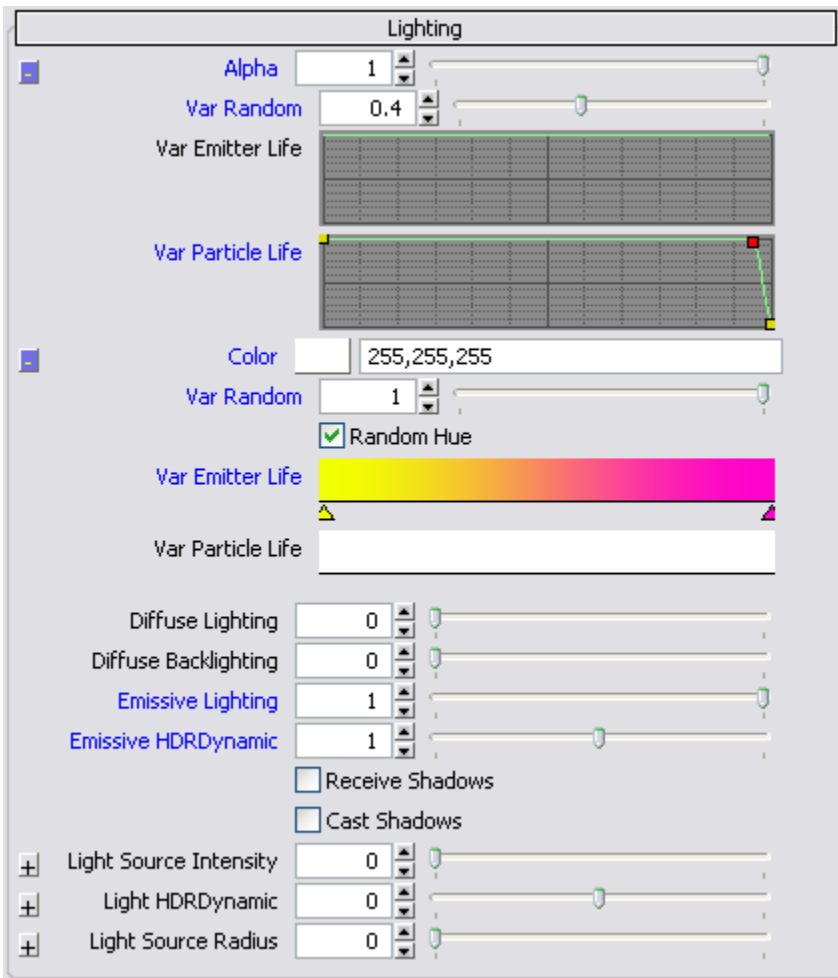
This will add trailing sparks as **second-generation** child particles (i.e. local) to the rocket.

So, add a **sub effect** and rename it to **TrailSparks**. Change its settings as in the screenshot below.

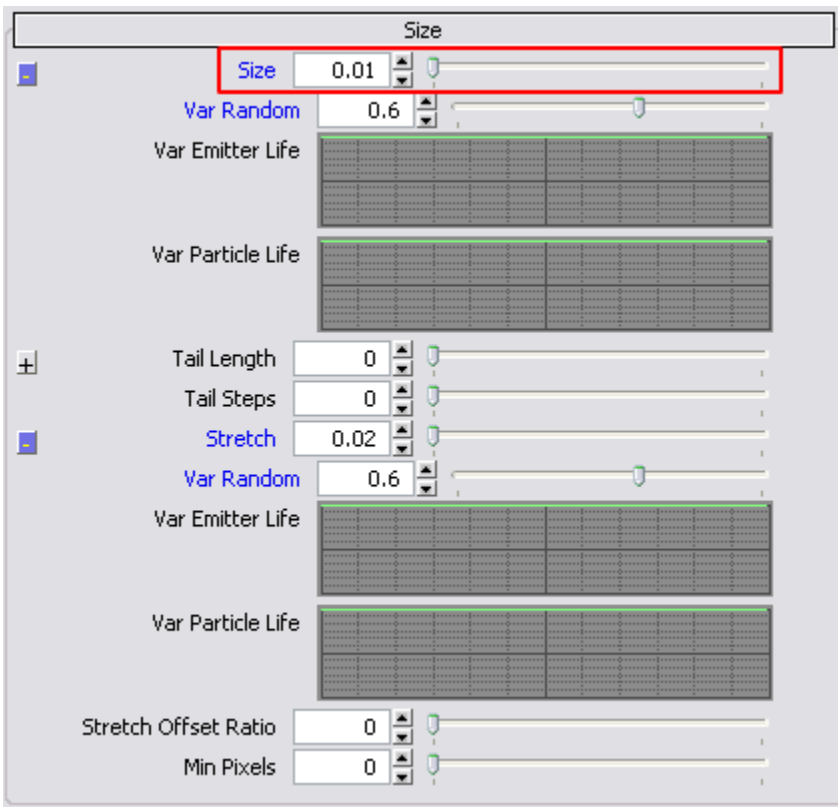


In the **appearance** pane, set the particle texture to `textures\sprites\sparks_multi_tiled.dds` and color blending to **ColorBased**. Then adjust the particle's texture tiling to fit the texture.

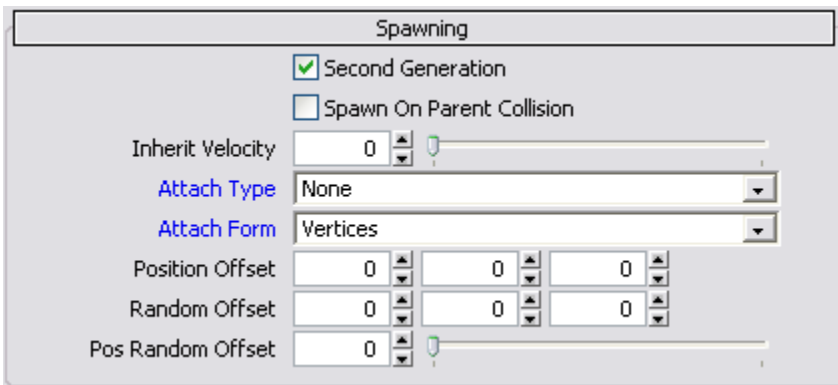
In the lighting pane, zero out the diffuse lighting term and change the emissive lighting terms to 1. Also adjust the alpha to fade out at the end. You can also change the particle's color fading to match the desired effect.



Since the texture chosen above is a little too huge for some small particles, change the particle size to 0.01. If desired, you should also adjust the stretch values.



Now, the important part: in the **spawning pane**, check the **Second Generation** box. This will create an sub-particle emitter per parent particle.



To have the sparks trail behind the rocket, set a **negative** speed in the **movement pane**. Also set gravity scale to 1 for a more realistic trail. Adjust air resistance and turbulence to your liking.

Since the trail should come out of the rocket's center, choose a **small emit angle** in the **angles pane**.

### Movement

**Speed** -3

Var Random 0.6

Var Emitter Life

**Air Resistance** 0.2

Var Random 0.4

Var Emitter Life

Var Particle Life

**Gravity Scale** 1

Acceleration 0 0 0

Turbulence3DSpeed 0

Turbulence Size 0

Turbulence Speed 200

### Angles

Focus Angle 0

Focus Azimuth 0

Focus Gravity Dir

**Emit Angle** 5

Var Random 0.5

Var Emitter Life

Init Angles 0 0 0

Random Angles 0 0 180

Rotation Rate 0 0 0

Random Rotation Rate 0 0 30

### Physics

**Physics Type** SimpleCollision

Collide Terrain

Collide Static Objects

Collide Dynamic Objects

Surface Type

**Bounciness** 0.2

Dynamic Friction 0

Thickness 1

Density 1000

Max Collision Events 2

Force Generation None



Finally, to make the particles bounce if it hits the ground, change the physics type to **SimpleCollision** and check the **Collide Terrain** box. Also choose some small bounciness as seen below.

Reload scripts and admire your fireworks.

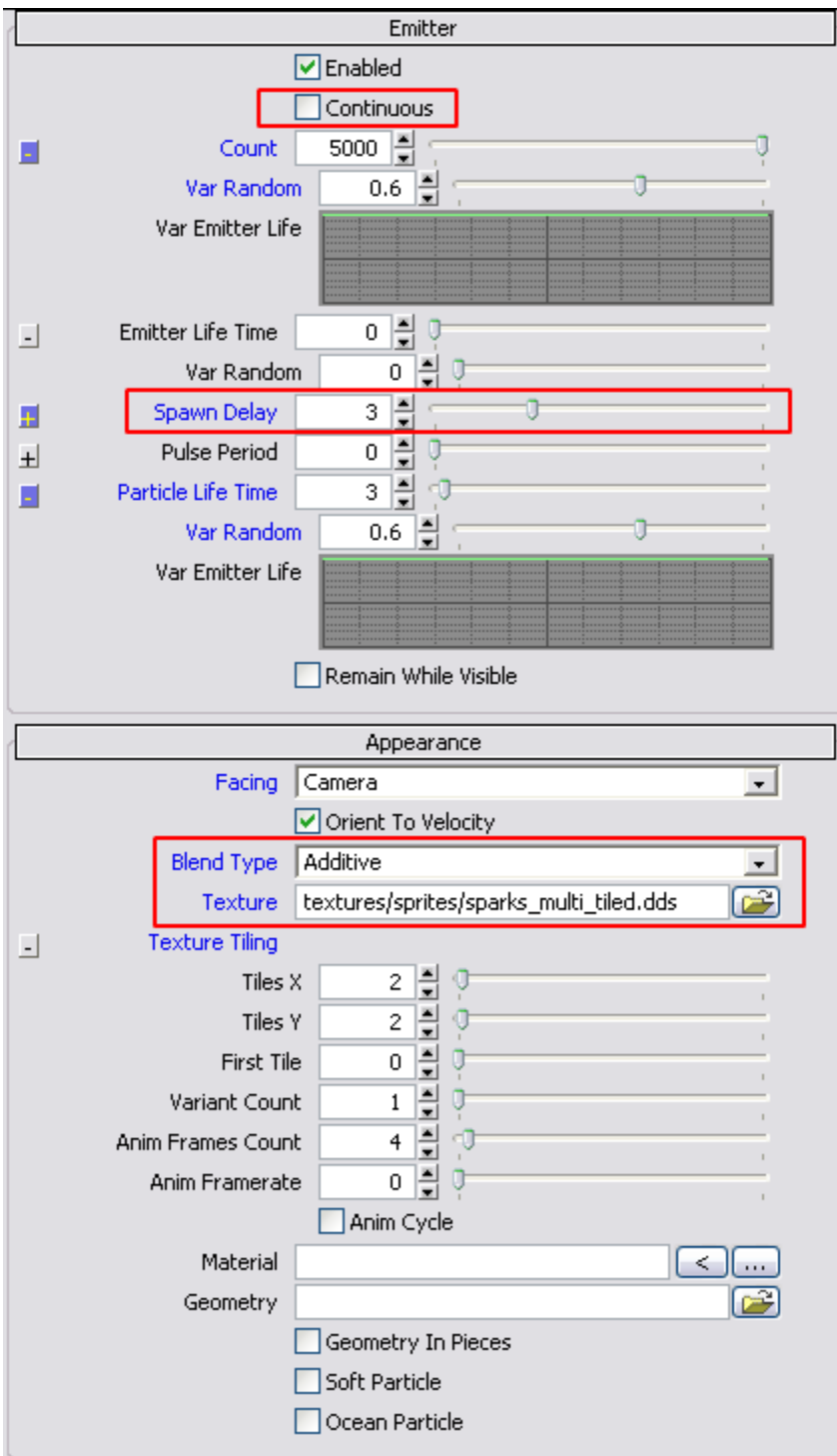


## Adding the Explosion

Now comes the really important part, the explosion.

For the explosion to look realistic, you need to emit many particles for each rocket.

Input the settings below for the **emitter pane**.

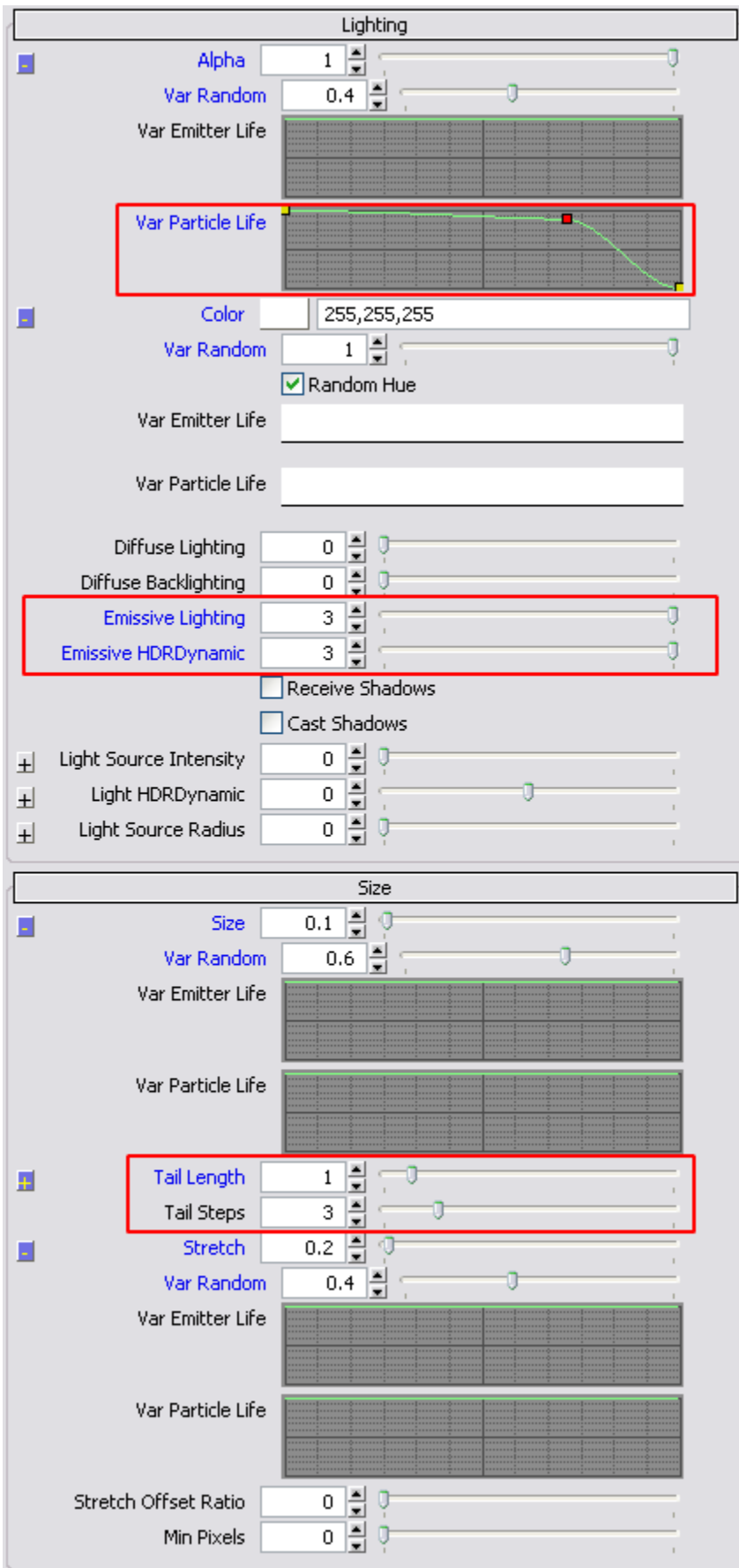


This will spawn about 5k particles at a given time (**delay**) and only once per rocket (continuous is **unchecked**).

Choose an additively blended texture in the **appearance pane**, e.g. textures\sprites\sparks\_multi\_tiled.dds.

Adjust the **alpha fading curve** in the **lighting pane**, and also, set the **emissive lighting** values to something about 3.

In the size pane, adjust size to 0.1 and stretch to 0.4. Also, add a trail as shown below.



The particle effect is also a **second-generation child effect**. So check to box accordingly in the **spawning pane**.

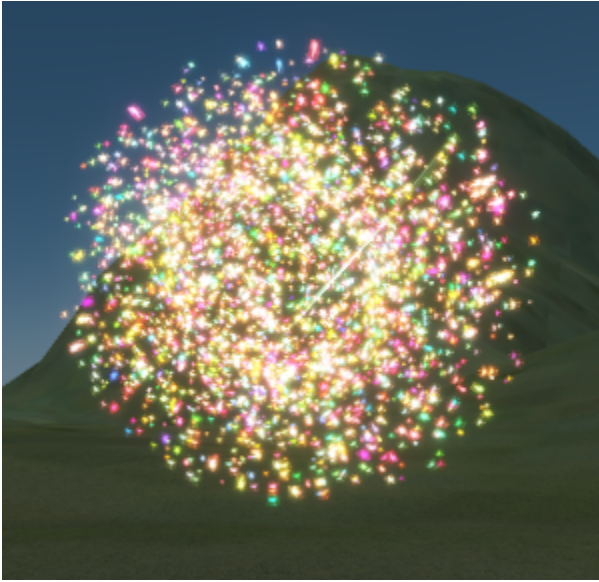
In the **movement pane**, set speed to about 10, air resistance to 0.2 and some turbulence speed.

In the angles pane, set the **emit angle to 180** with a random variation of 1.

The image shows a software interface with three main panels: Spawning, Movement, and Angles.

- Spawning Panel:**
  - Second Generation** (highlighted with a red box)
  - Spawn On Parent Collision
  - Inherit Velocity: 0
  - Attach Type: None
  - Attach Form: Vertices
  - Position Offset: 0, 0, 0
  - Random Offset: 0, 0, 0
  - Pos Random Offset: 0
- Movement Panel:**
  - Speed: 5
  - Var Random: 0.6
  - Var Emitter Life: [Grid]
  - Air Resistance: 0.2
  - Var Random: 0.4
  - Var Emitter Life: [Grid]
  - Var Particle Life: [Grid]
  - Gravity Scale: 0
  - Acceleration: 0, 0, 0
  - Turbulence3DSpeed: 0
  - Turbulence Size: 0
  - Turbulence Speed: 200
- Angles Panel:**
  - Focus Angle: 0
  - Focus Azimuth: 0
  - Focus Gravity Dir
  - Emit Angle: 180 (highlighted with a red box)
  - Var Random: 1 (highlighted with a red box)
  - Var Emitter Life: [Grid]
  - Init Angles: 0, 0, 0
  - Random Angles: 0, 0, 0
  - Rotation Rate: 0, 0, 0
  - Random Rotation Rate: 0, 0, 0

That's it. Now save, reload scripts, and enjoy your fireworks.



### **As a Practice Exercise**

- Add even more sparks as second generation child to the explosion particles.
- Put the fire and fireworks together to have a big explosion. Call this effect DeadlyFireworks.

You don't have to create every effect by hand. You can simply copy and paste effects inside of [The DataBase View](#).