Space Builder Genesis

Table of contents

Welcome

Introduction

Space Builder : Genesis is a Spatial Environment Creator, that allow you to create amazing space scene with few click.

With WYSIWYG editing and a custom interface, the creation will be simple and intuitive. You have at your disposal the tools to create the following elements :

All Unity version

- 3D fractal nebula
- 2 starfield layer (Empty space, and nebula space)
- Starburst to add detail where you want
- Planet (Advance Planet Shader inside)
- Sun for illuminate your scene
- Cosmos particles, for speed effect
- Mass creation for asteroid field for example
- Original skybox
- Random engine for all element

Unity Pro only

- Render static elements in a skybox
- Choose between pre-compute or real time skybox rendering

Watch the video presentation
https://www.youtube.com/watch?v=60iHuMDoNSU&noredirect=1

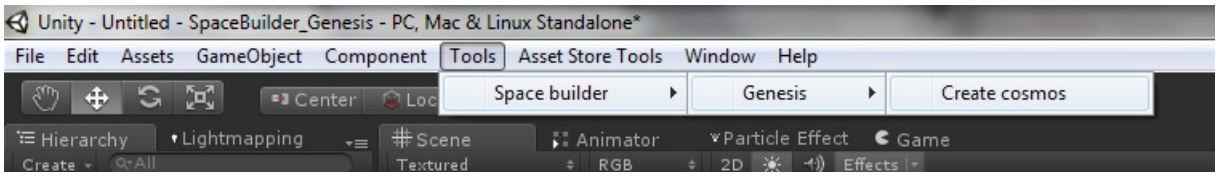
Official topic
http://forum.unity3d.com/threads/space-builder-genesis-spatial-environment-generator.270109/#post-1784472

Support forum
http://www.darkanvil.com/?page_id=100

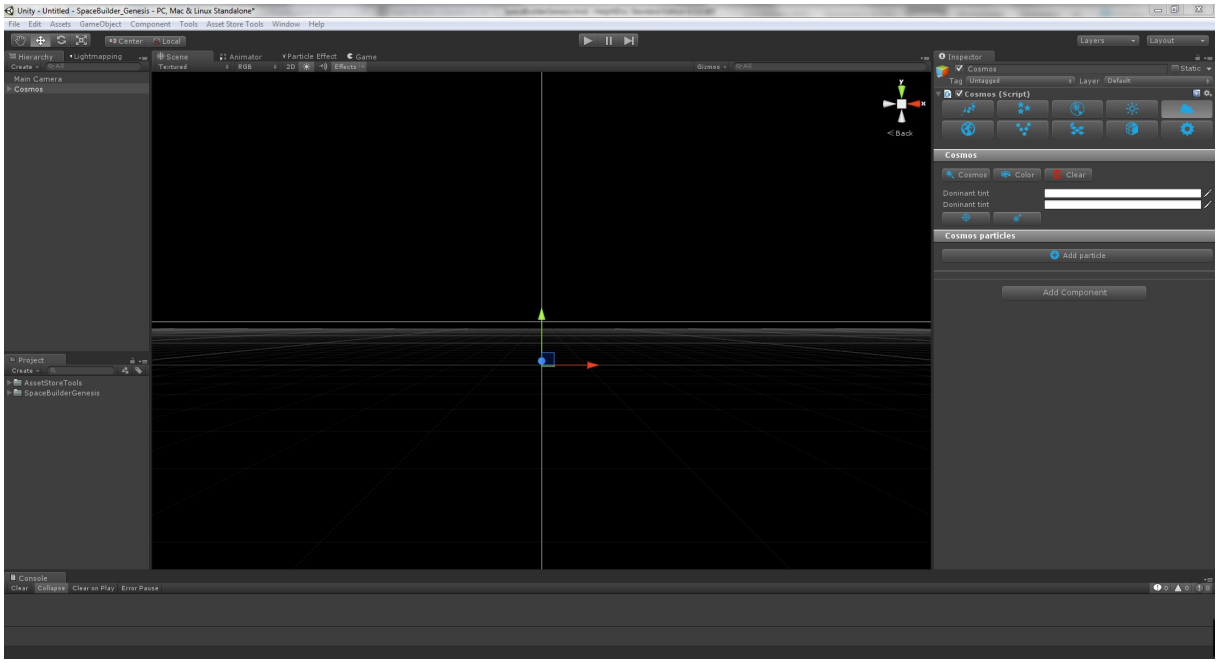
Quick Start

Enough talk, now create our first environment

1-Add cosmos to your scene.

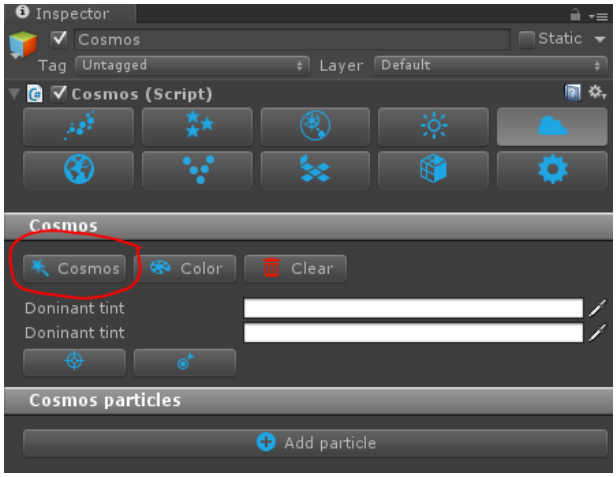


Your scene should look like this, with the "Cosmos" gameobject selected.



2- Generate random environment by clicking the "Cosmos" button on inspector.

Generation may take a few seconds.



Example of random generation

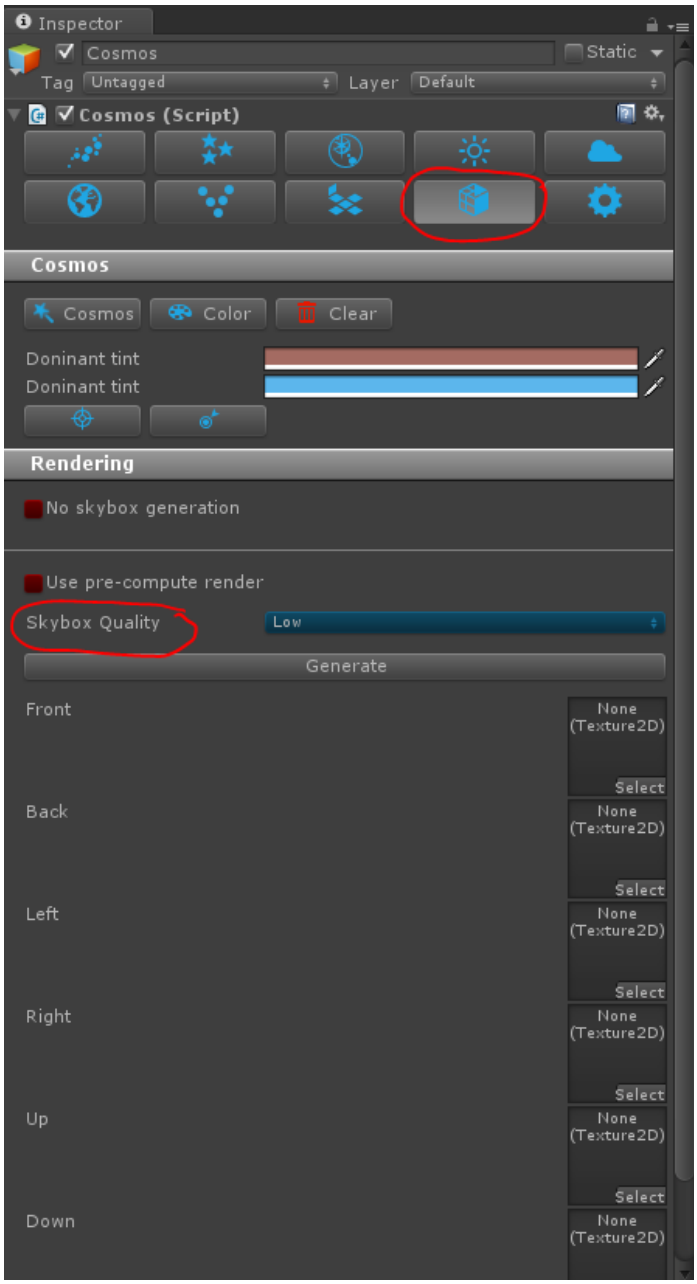
3- Set the rendering quality of the nebula.

By default they are calculated in draft mode to speed up processing.

- Select Nebula mode with the toolbar.
– Change the quality field to Low (The difference may not be visible depending on Nebula type)

4- For Unity Pro, set the rendering quality of the skybox.

- Select Rendering mode with the toolbar.
- Change skybox quality field to High (The difference may not be visible depending on Nebula type)



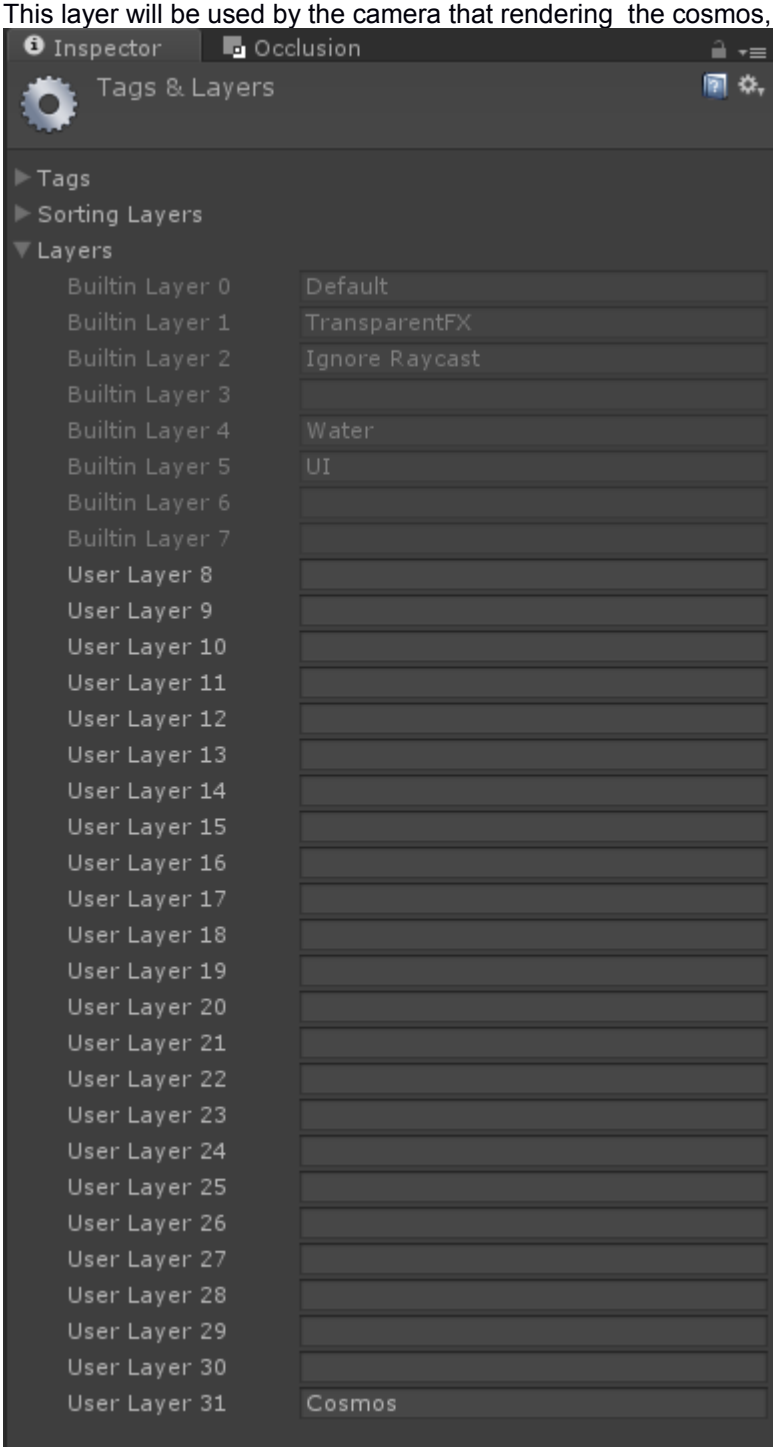
How it works

Project description

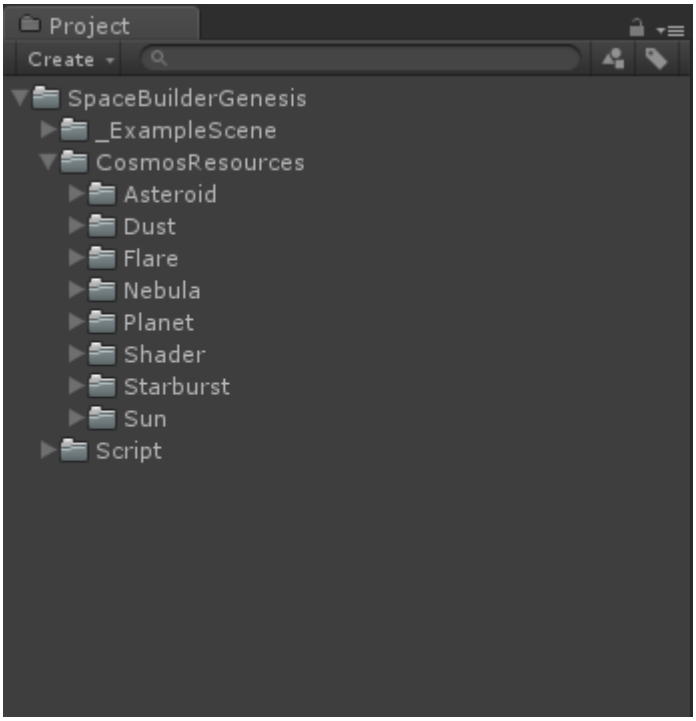
Layer

The label "Cosmos" will automatically assign to the layer 31 when you import the package

This layer will be used by the camera that rendering the cosmos, you shouldn't use it for anything else.



Project View



After importing, you will have this architecture

_ExampleScene

Contains scenes example

CosmosRessouces

All the resources used by SBG (textures, shaders, materials...)
It is in these directories you can add your own media, if you want them to be taken into account during the various random generation.

You mustn't in any case rename or delete a directory

Script

Contains all the scripts needed to run SBG.

2 Cameras and a layer

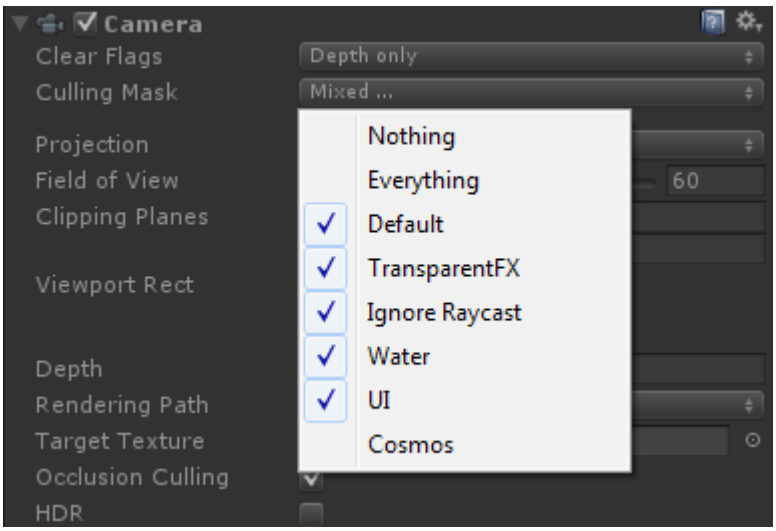
Space Builder Genesis uses 2 camera :

- The main camera of your scene, that you must setup here if it isn't flag "MainCamera".
- A second camera that automatically creates at the startup, which will only display element on **layer 31 "cosmos".**

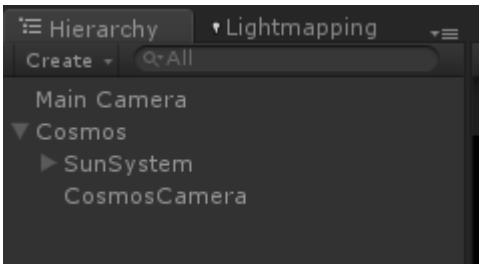
All objects will be created with the custom cosmos inspector will have the layer 31 "Cosmos"

What's happening in play mode

1. Culling mask of the main camera is changed, so it does not show the elements of the layer 31.
2. The clear flag of the main camera is set to Depth Only.



3. A new camera is created "CosmosCamera" as child of Cosmos gameObject
4. Culling mask is changed to only show layer31
5. The clear flag is set to skybox



Nebula & starfield

Space Builder Genesis uses dynamic texture for rendering nebulae & starfield.
This textures are used on a specific skybox shader for WYSIWYG editing & final result for Unity Free user.

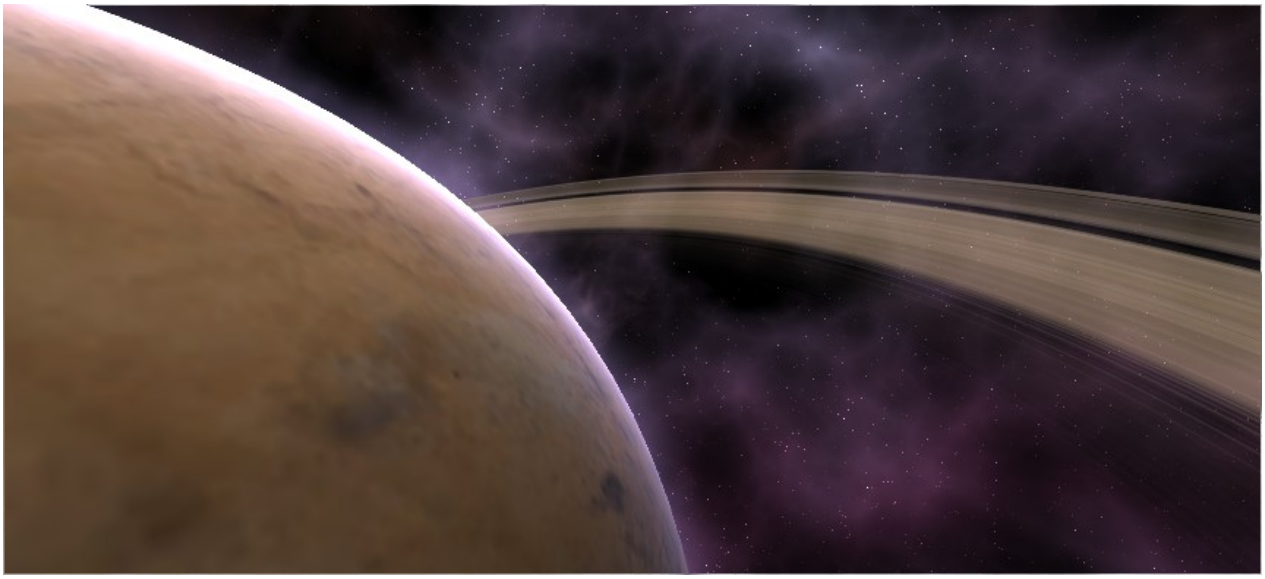
More detail on nebulae here

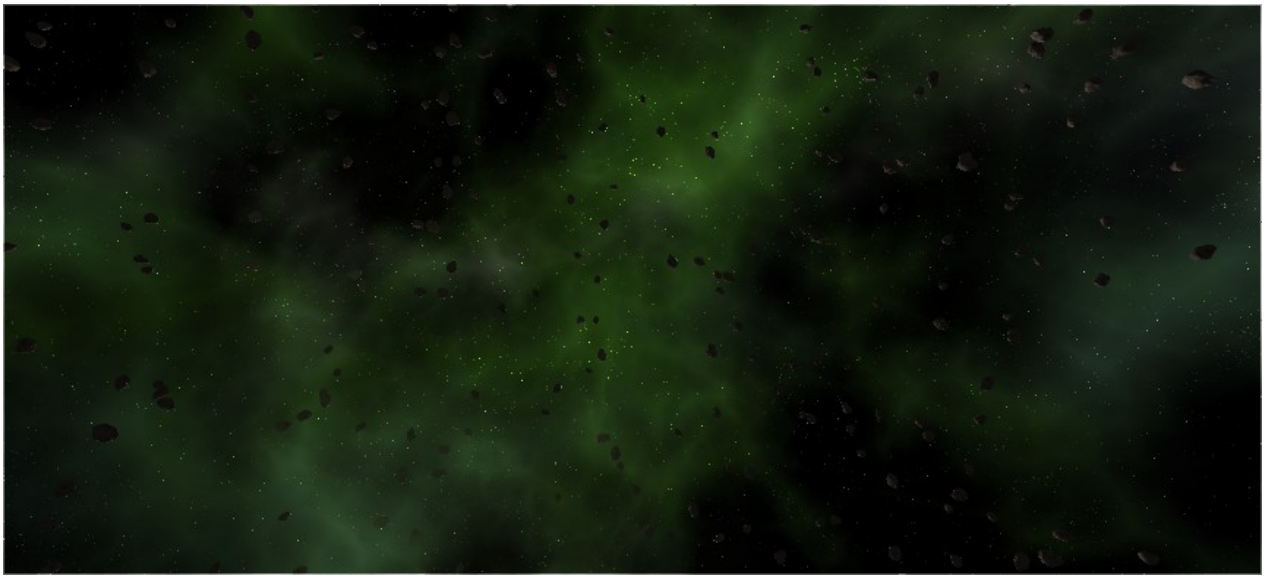
3D Fractal Nebulae

For an environment that loop, nebulae are calculated from 3D fractal to match the 6 faces of a skybox.These 3D fractal have been simplified and pre-set for you.

These nebulae have rendering types (Cloudy, Veined) and different blend, It is by adding nebulae of different types that you get the best results.

Example :





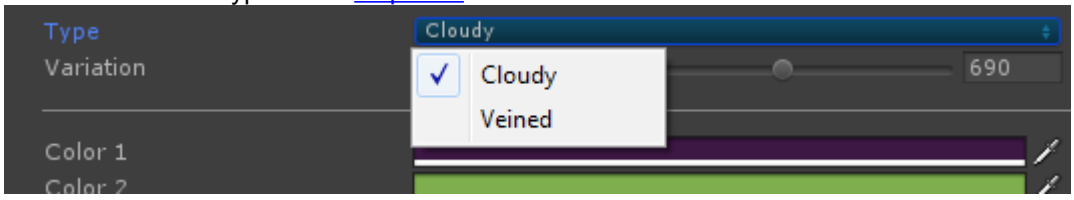
Nebula type

Rendering type or nebula type

SBG offers 2 different type of rendering for nebulae, including 1 with overlay mode :

- Cloudy with 2 overlay
- Veined

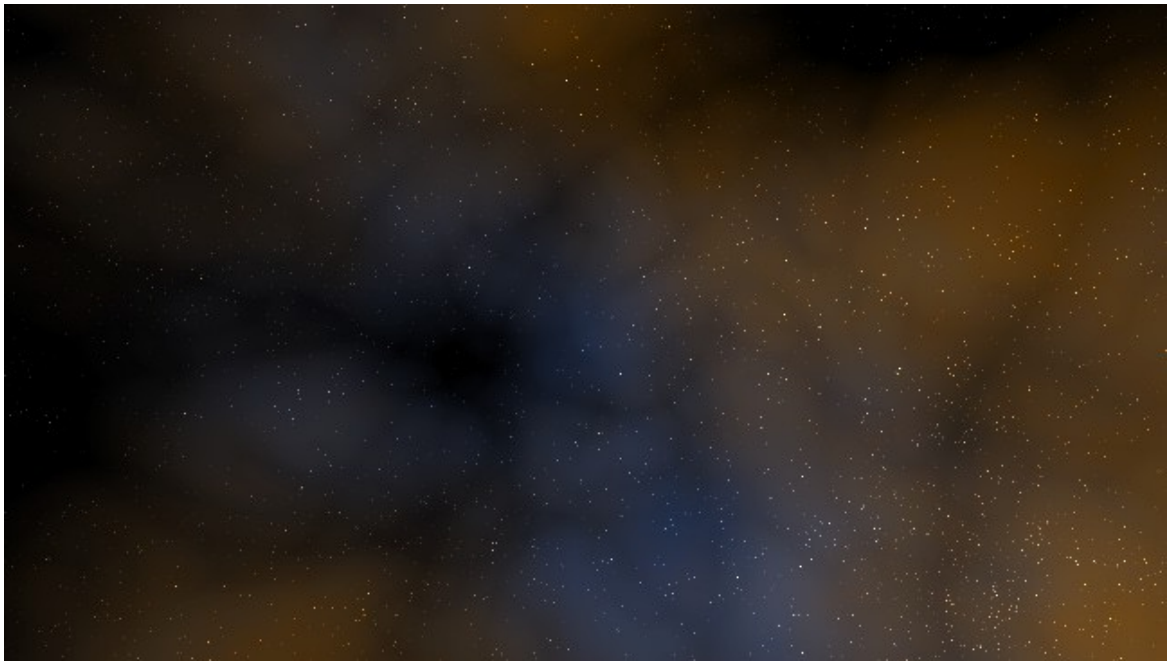
You can affect the type in the Inspector



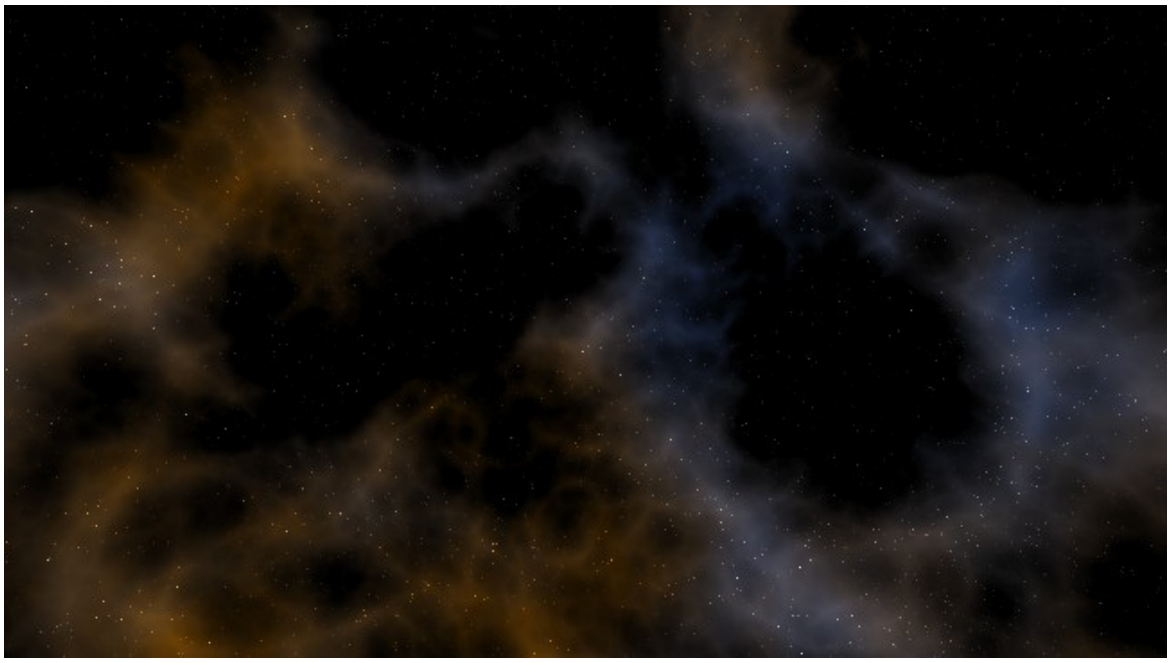
SBG supports an unlimited number of nebula of each type, with different modes of superposition

Different types imaged

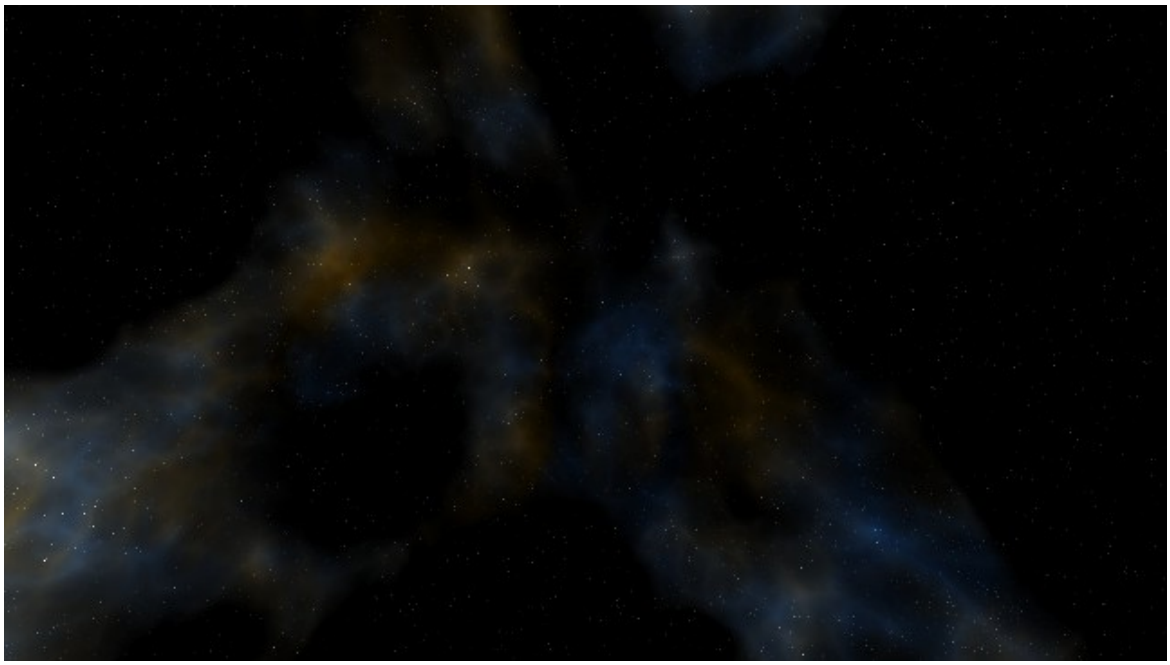
Cloudy with overlay style 1



Cloudy with overlay style 2



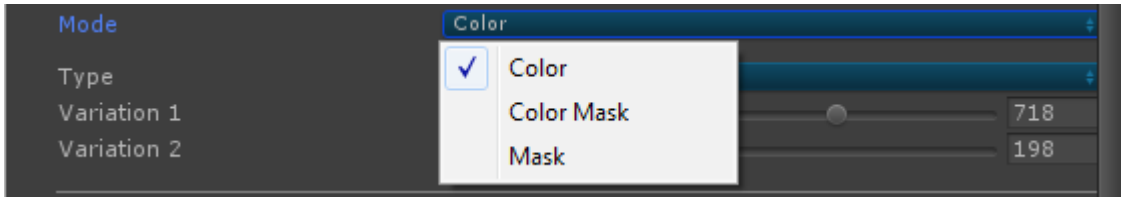
Veined



Nebula mode

Nebula mode or nebula rendering mode

SBG supports an unlimited number of nebula of each type, 3 rendering mode are available for layering nebulae.

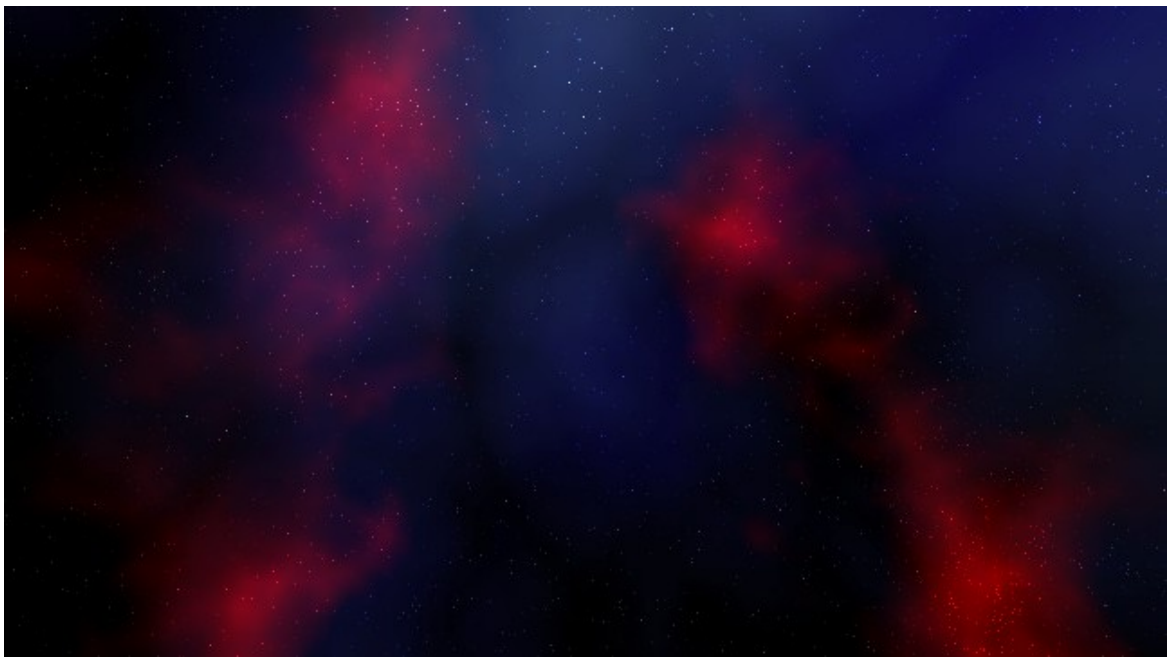


By default the Color mode is used

Color mode

It's default mode, it performs a simple addition between the nebulae. Rendering order doesn't affect the result.

Example
-1 Full Blue Cloudy nebula
-1 Full red Veined nebula



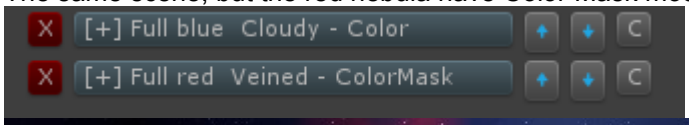
Color Mask

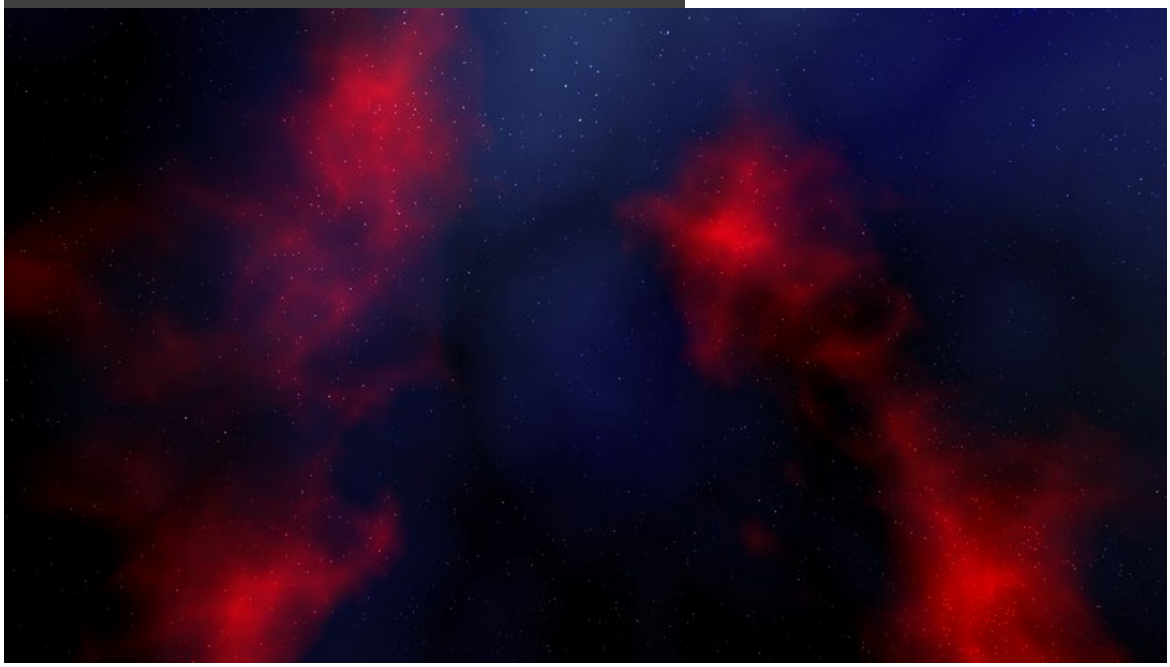
This mode minimizes the addition between the nebula, and enhances the colors of nebula that have this mask

The order of the nebula has an impact on the final result

Example 1

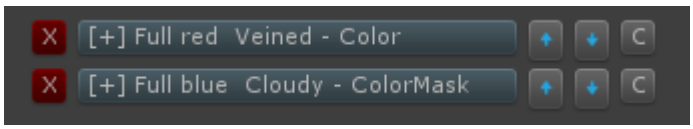
The same scene, but the red nebula have Color Mask mode

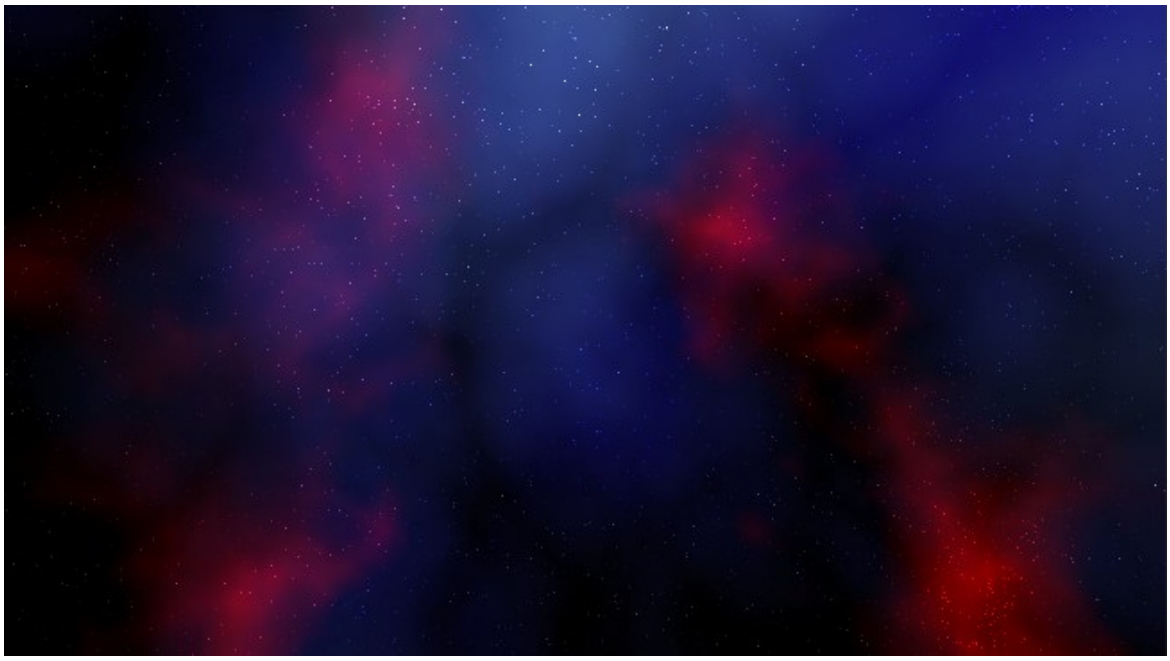




Example 2

The order of the nebula has been reversed, the result is different

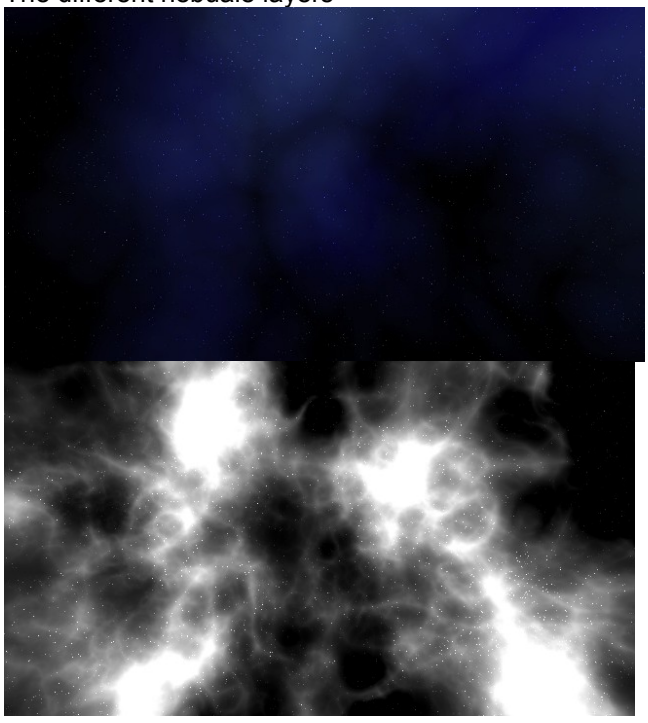




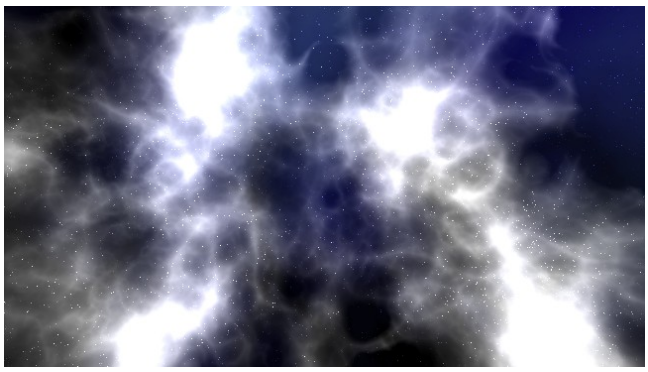
Mask

This mode allows the rendering of a nebula according to another.The order of the nebula has an impact on the final result.
The nebula Mask mode must have its colors to full white.

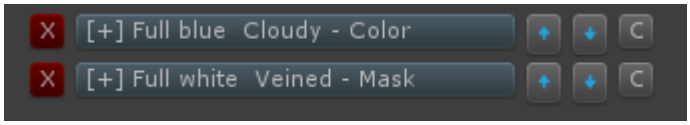
Example
The different nebuale layers

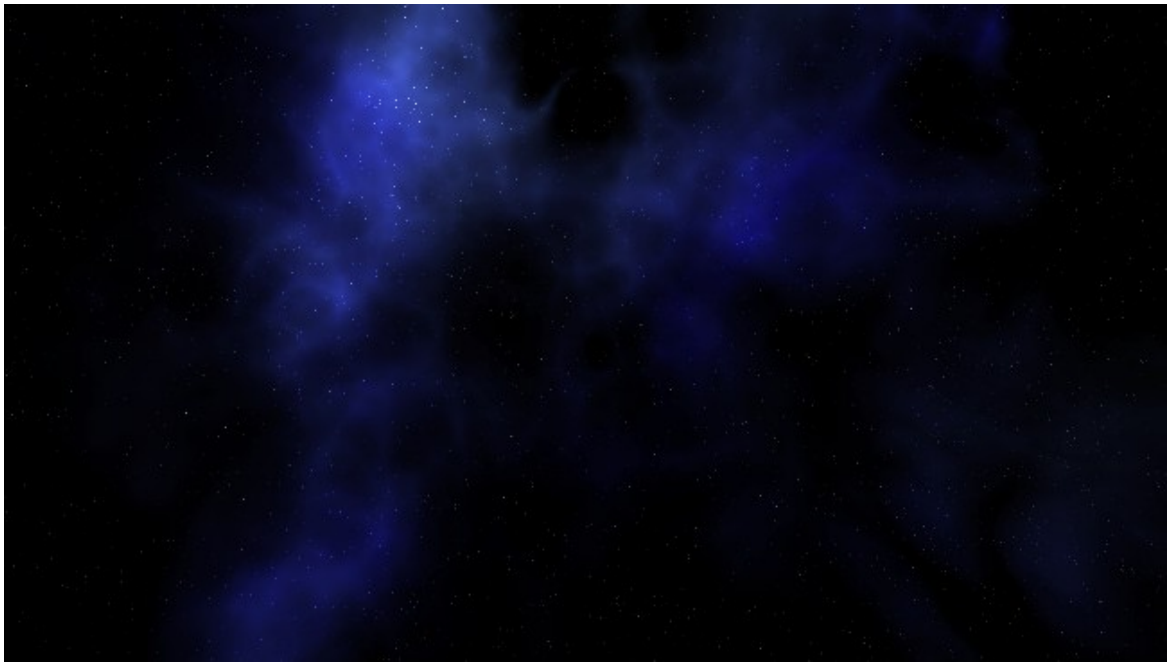


color mode



The final result with Mask mode





Shader

SBG uses 4 shaders, which is located in the directory "SpaceBuilderGenesis/CosmosResources/Shader"

Focus on Skybox3Level

This shader combines three layers of texture to display a skybox.

1 - Original skybox

2 - Nebulae layer
3 - starfield layer

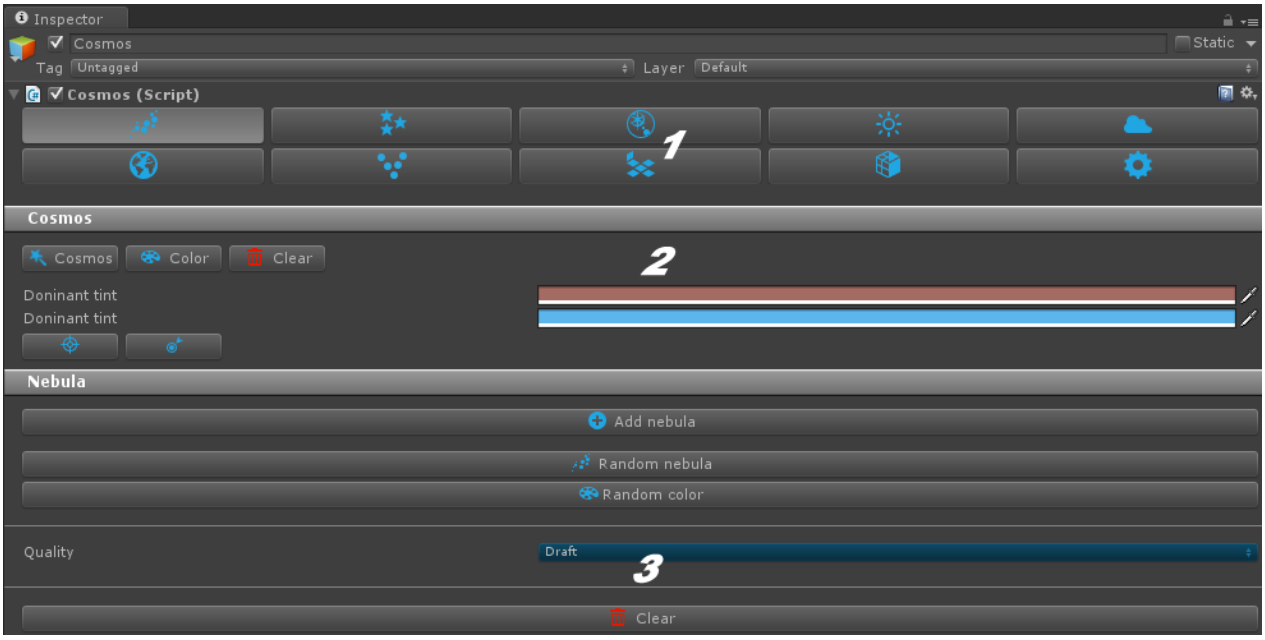
Each layer can have different texture sizes

Other shaders

They come from our pack : Advanced Planet Shader.
By default SBG use shader Planet BA / Atmosphere / Planet Ring, and a custom inspector.
However you can use other planet shader easily, but without custom interface

Custom Inspector

The inspector of the cosmos will allow you to control all the elements of your universe. The inspector is divided into three areas listed below



1- ToolBar

This section gives you access to various tools that are available. Look at chapter toolbar for more information.

2- Cosmos

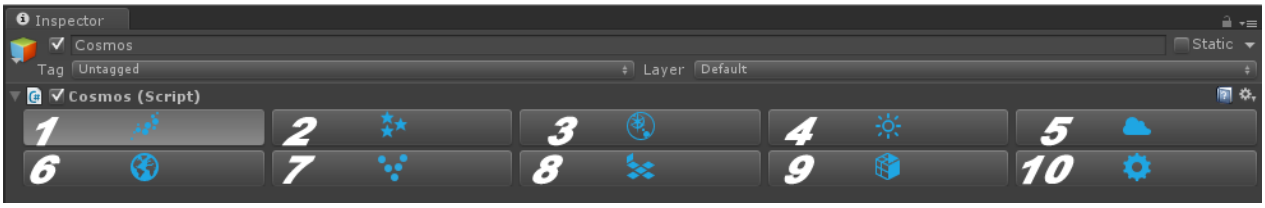
This area provides options that will affect your entire scene.

3- Properties space

Dynamic area based on the tool selected in the toolbar

Toolbar

The toolbar gives you access to 10 tools to create or edit your environment



1 - Nebula

creation / editing of 3D Fractal nebula.

2 - Star field

creation / editing star field.

3 - Star burst & static nebula

creation / editing star burst & static nebula.

4 - Sun

creation / editing sun (light).

5 - Cosmos particles

creation / editing cosmos particles for speed effect.

6 - Planet

creation / editing planet.

7 - Mass creation

creation / editing mass creation area.

8 - Original skybox

Setting the original skybox.

9 - Rendering options

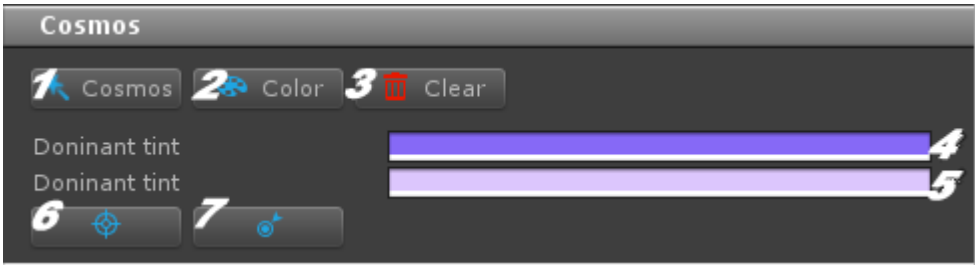
Setting options of rendering the final skybox (Unity Pro only).

10 - Setting

Setting some general options

Created with the Standard Edition of HelpNDoc: Easy CHM and documentation editor

Cosmos



(1) Random Cosmos

Random generation of cosmos
More detail here

(2/4/5) Ranom Color & Dominant tint

Colorize your unviers
More detal here

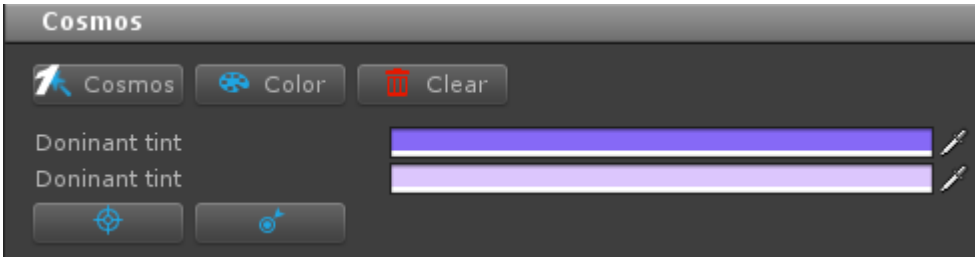
(6/7) Center view & Global view

Look at your scene from different angles
More detail here

(3) Clear

Clears all elements of the scene

Random cosmos



(1) Cosmos

This button allows you to randomly generate cosmos.

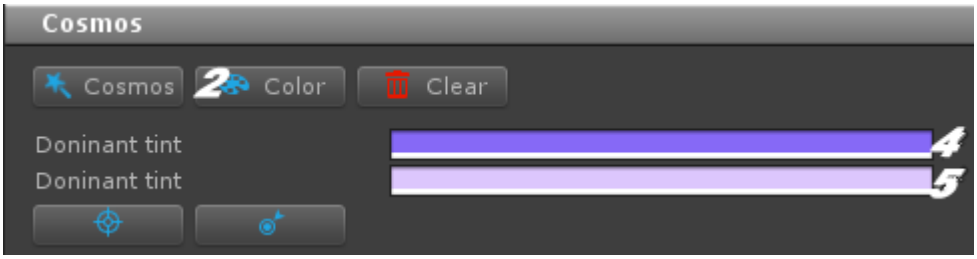
What is it in detail (Each element can't be generated)

- Random assignment of dominant color.
- Generation of 3D Fractal nebulae
- Generation of a star field
- Generation of planets random ring, random asteroid field, random atmosphere
- Generation of an overall random asteroid fields

Warning
Already present items will be deleted by the result of the random generation

You can enable or disable the items that will be able to be generated via options in the setting

Color & Dominant tint



(4 & 5) Dominant tint

The dominant colors allow to set hues of colors that will be used in your scene to give harmony to your cosmos. They operate several different ways.

They are taken into account by:

* Nebulae 3D fractal
* The star bursts
* The effects of atmosphere on planets

When one of these elements will be created, it will take these colors randomly with at different levels of intensity.

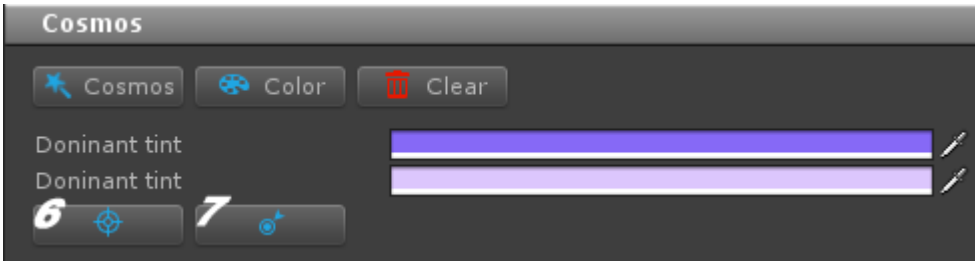
Tips :

If the two dominant colors are white, the elements take a completely random color without a harmony (but chance sometimes good things)

(2) Color button

This button allows you to set the colors of the elements already in your scene. Given that the colors are considered at different levels each click will give you a different result.

Center view & Global view



(6) Center view

This button replace the scene view camera at the center of work.

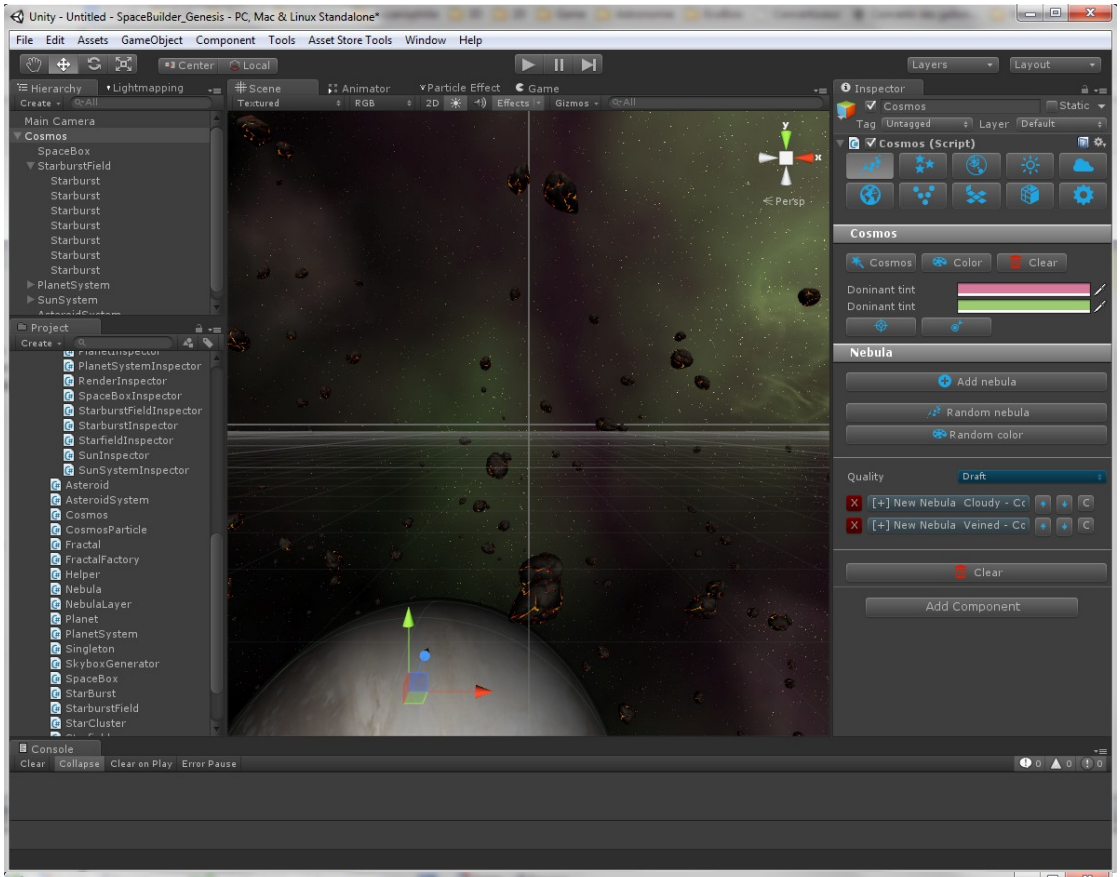
This is the best view to judge the final result, or the placement of the various elements (planets, star burst)

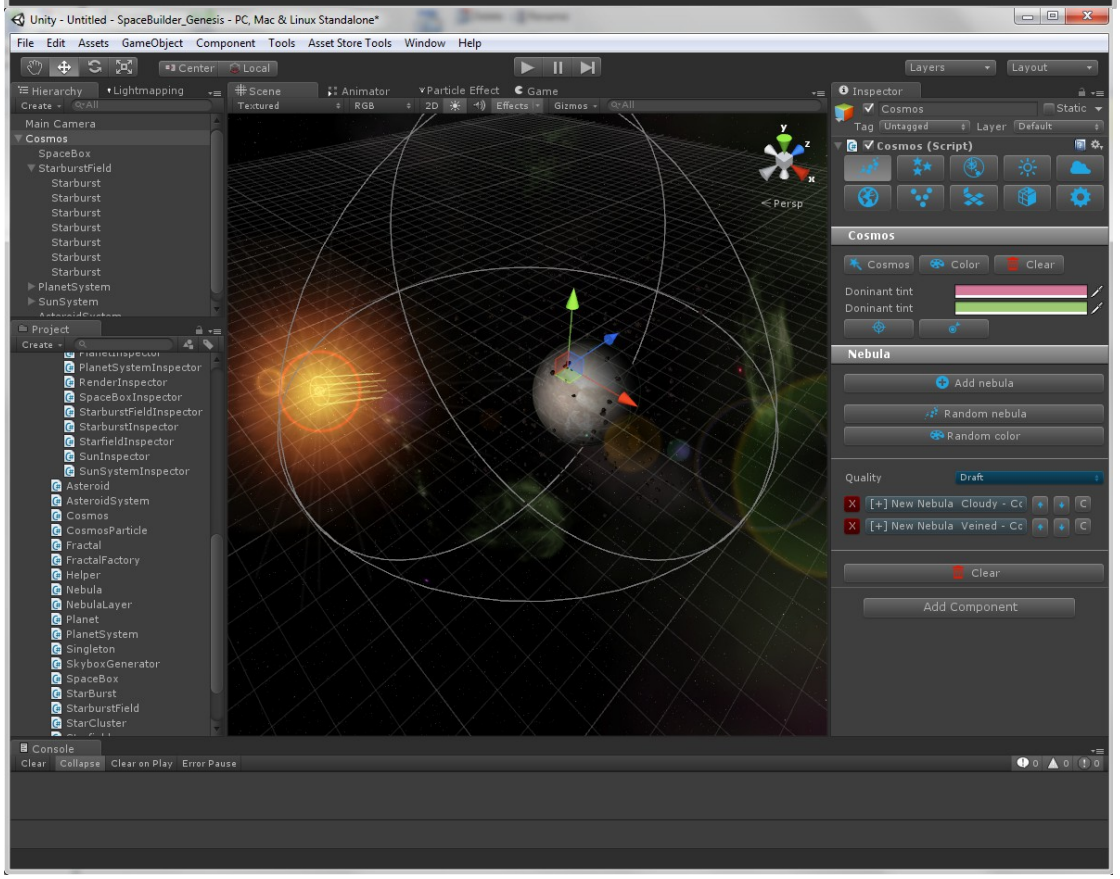
(7) Global view

This button Place the scene view camera to see the whole scene. A white wireframe plot represents the limits of the environment, which are arranged suns and star bursts

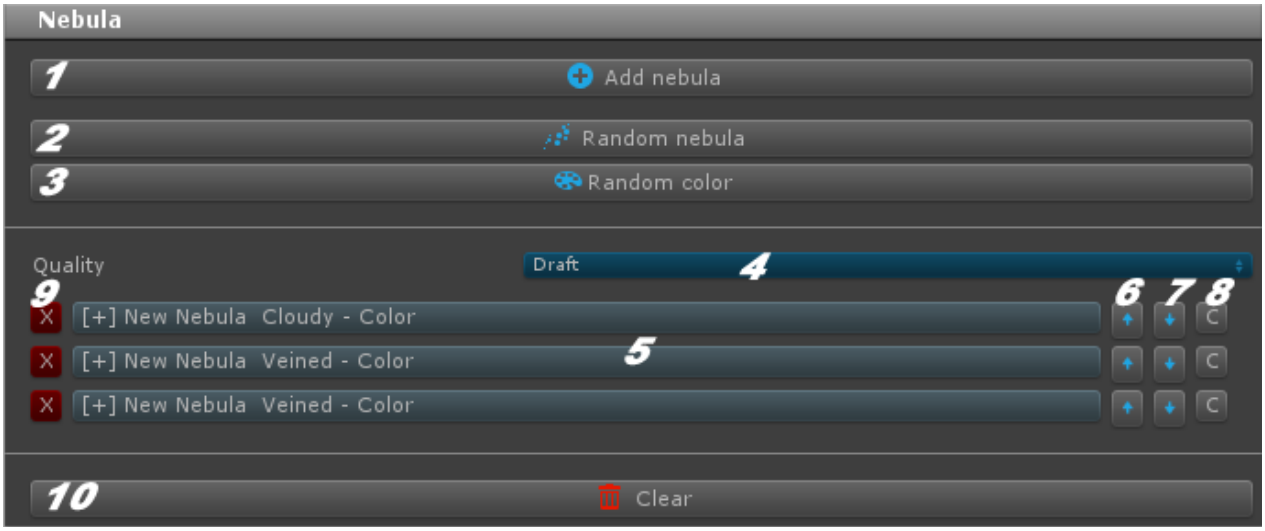
This is the best view to place mass creation

Example of center & global view of the same scene


Unity - Untitled - SpaceBuilder_Genesis - PC, Mac & Linux Standalone*
File Edit Assets GameObject Component Tools Asset Store Tools Window Help
Hierarchy
Scene
Animator
Particle Effect
Game
Inspector
Cosmos
Cosmos (Script)
Nebula
Add nebula
Random nebula
Random color
Add Component
Console


Unity - Untitled - SpaceBuilder_Genesis - PC, Mac & Linux Standalone*
File Edit Assets GameObject Component Tools Asset Store Tools Window Help
Hierarchy
Scene
Animator
Particle Effect
Game
Inspector
Cosmos
Cosmos (Script)
Nebula
Add nebula
Random nebula
Random color
Add Component
Console

Nebula



(1) Add nebula

Adds a new nebula on your scene. Quality is automatically repositioned on Draft.

(2) Random nebula

Adds a random number of nebula, by replacing the existing one. Quality is automatically repositioned on Draft.

(3) Random Color

Colorize all existing nebulae, depending on rules of dominant color. Quality is automatically repositioned on Draft.

(4) Quality

Sets the rendering quality nebulae.All nebulae is automatically calculated when changing
More detail here

(5) List of nebulae

Each line can be unfolded to access the different parameters of the nebula.
More detail on cloudy nebula
More detail on veinded nebula

(6) Up

Up the nebula in the rendering order relative to nebula mode. All nebulae is automatically calculated when changing

(7) Down

Down the nebula in the rendering order relative to nebula mode. All nebulae is automatically calculated when changing

(8) Copy

Copy the nebula

(9) Delete

Delete the nebula. All nebulae is automatically calculated when changing

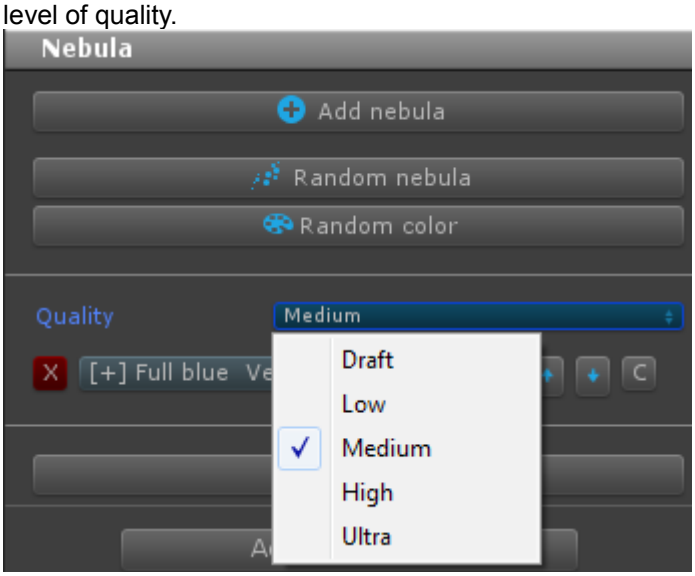
(10) Clear

Clear all nebulae.

Nebula quality

Nebulae are calculated based on a quality level. By default quality level is set to Draft to optimize computation time

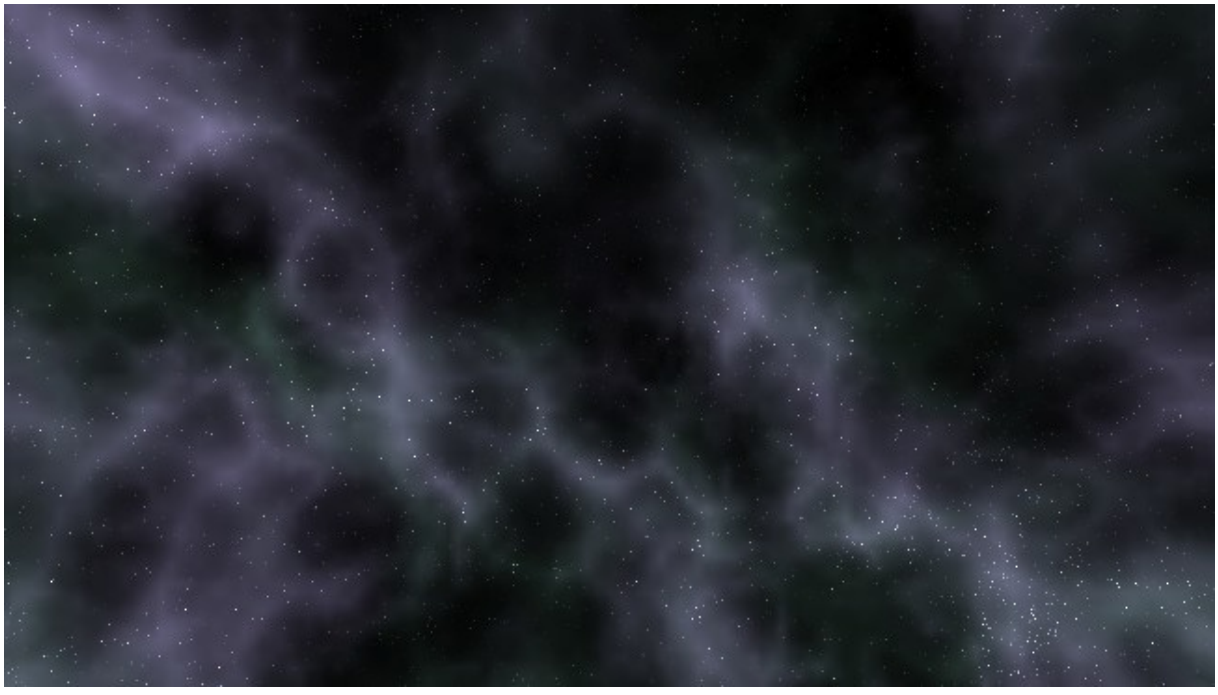
You have 4 levels of quality + the draft level. The nebulae level of detail increases proportionally with the level of quality.



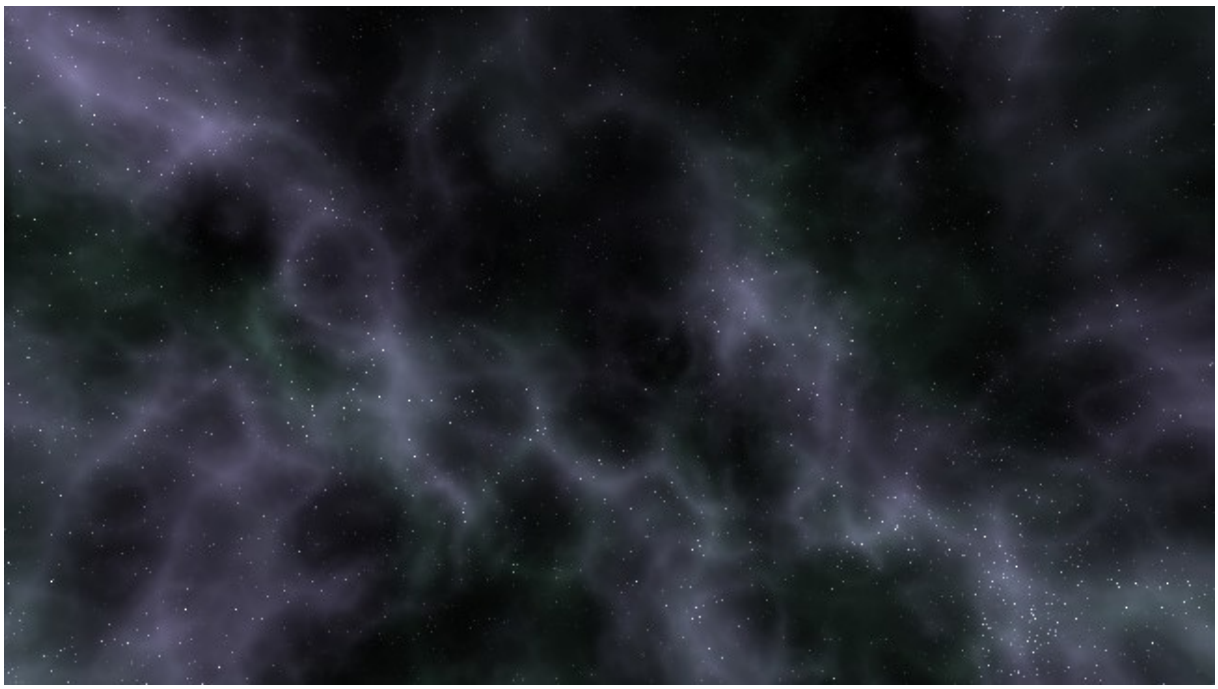
The quality level has more impact on the nebulae type veined as on cloudy

Example

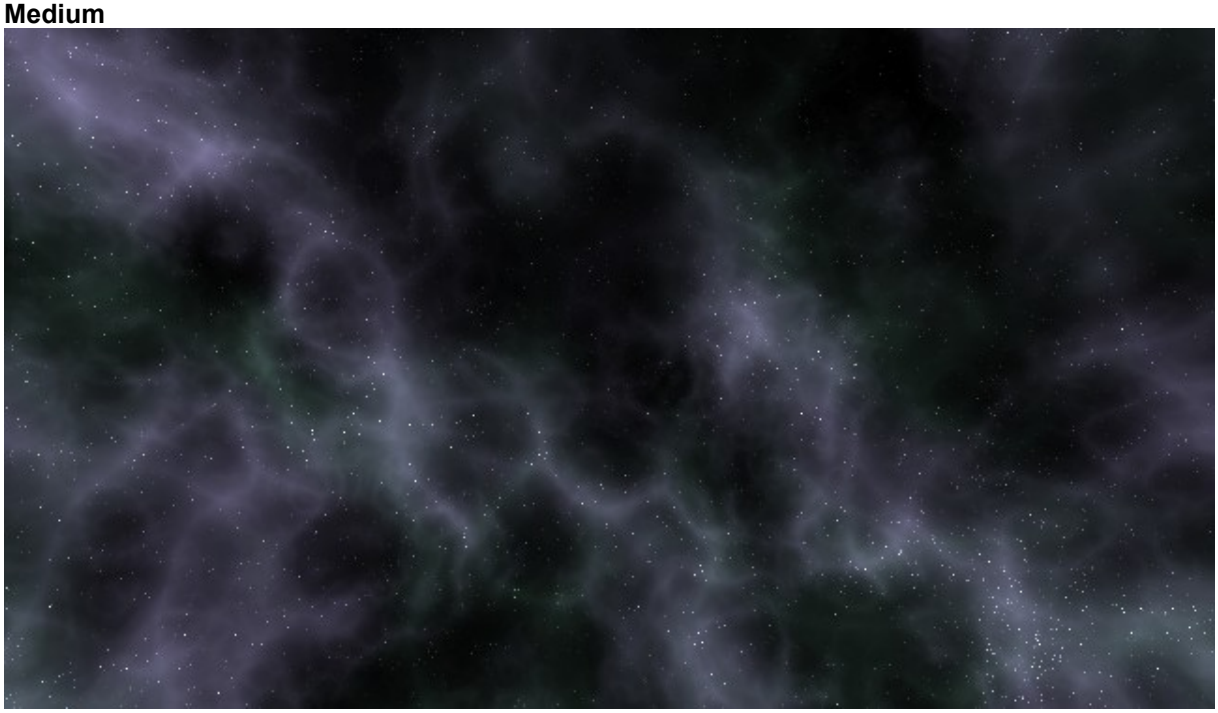
Draft



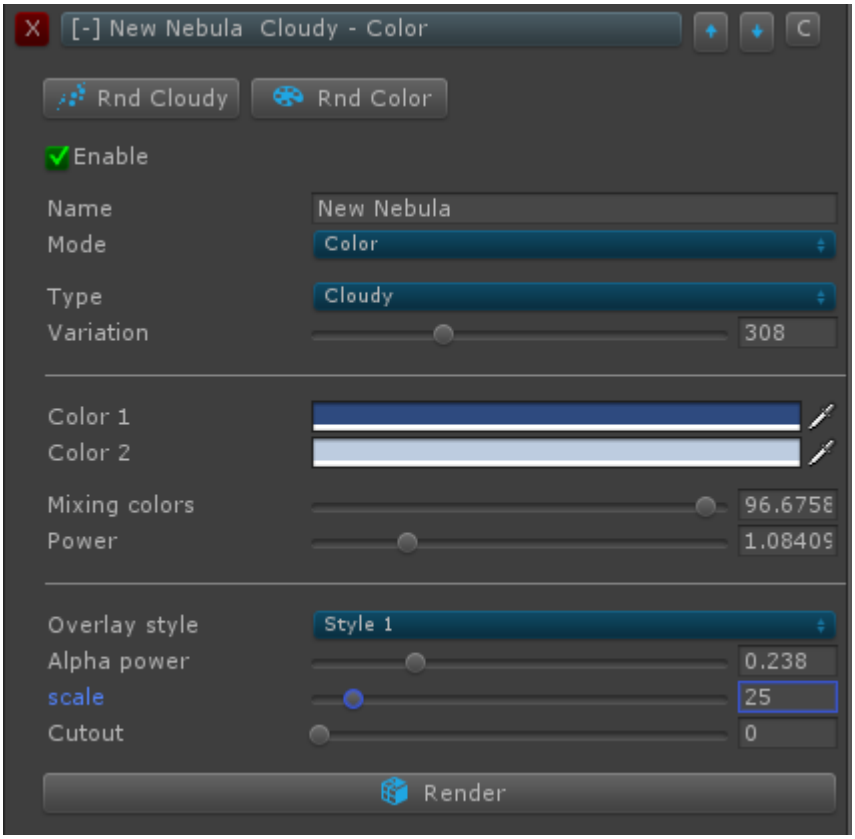
Low



Medium



Cloudy nebula



Rnd Cloudy (button)

Random generation of parameters

Rnd Color (button)

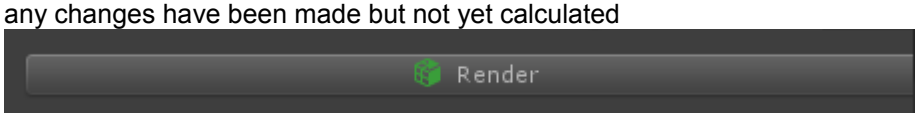
Random generation of Color1 & Color2 relative to Dominant tint

Render (Button)

The computation time is relative :

- Quality Level
- Power your processor
- Number of nebulae already present

So you have to run a calculation when you make changes. The button changes to green color, if any changes have been made but not yet calculated



Enable

Enables or disables this nebula for the final result

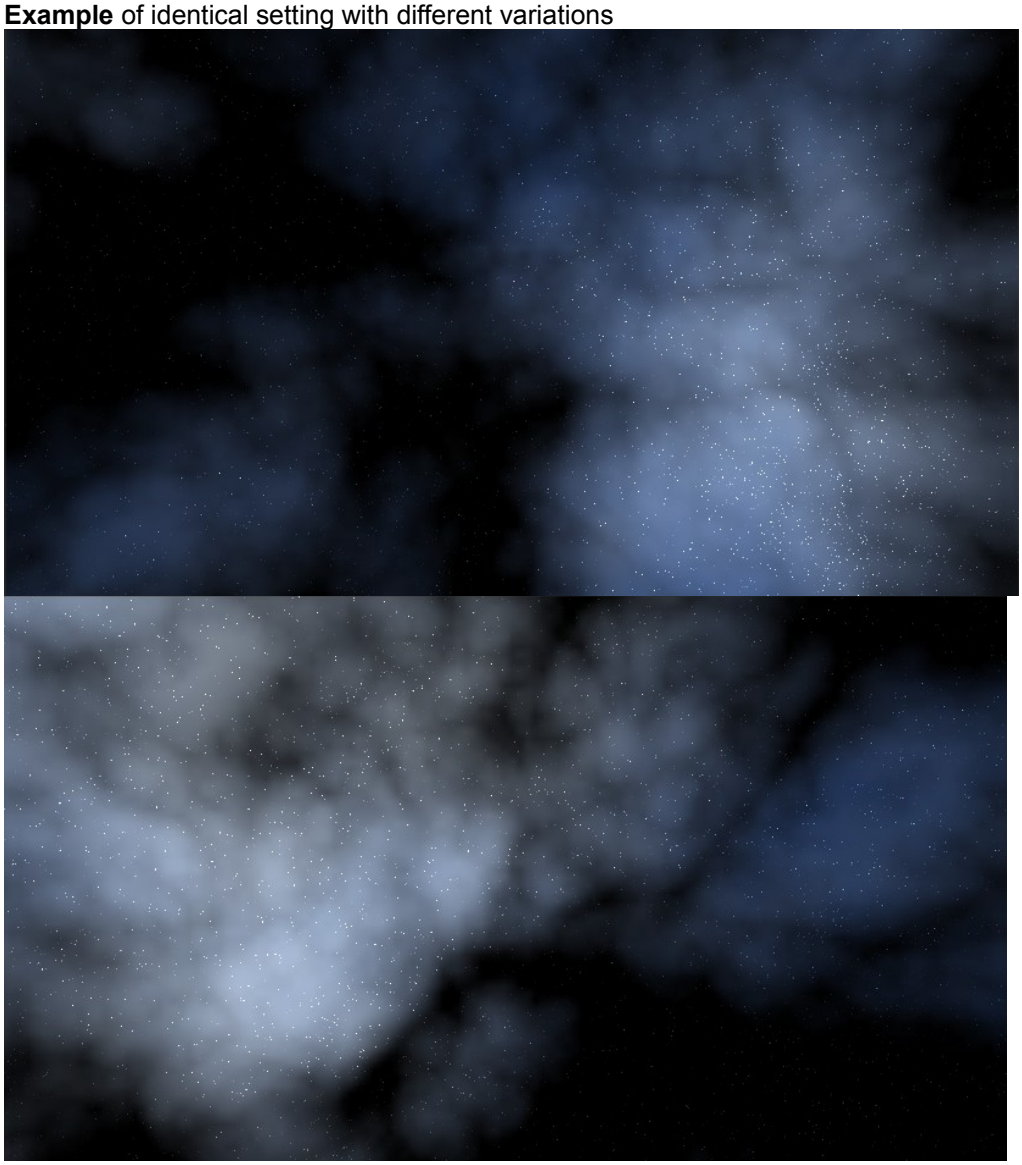
Mode

Rendering mode of nebula

Variation

Generates variation for setting

Example of identical setting with different variations



Color 1 & Color2

The colors used for rendering

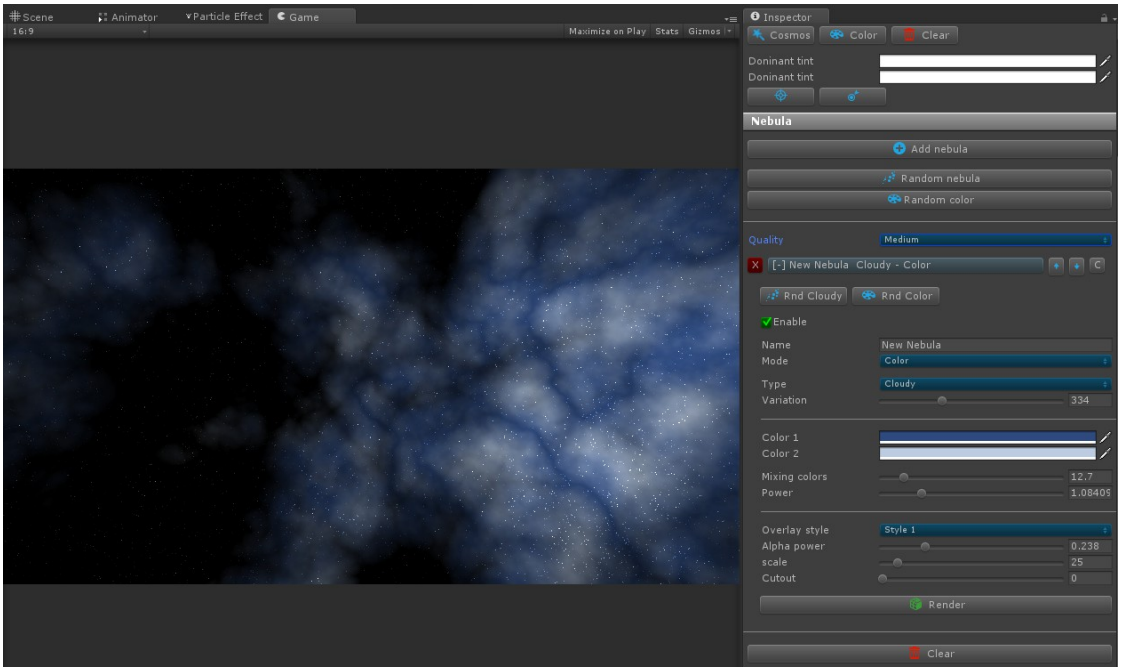
Mixing colors

Changes the distribution of two colors in the rendering.

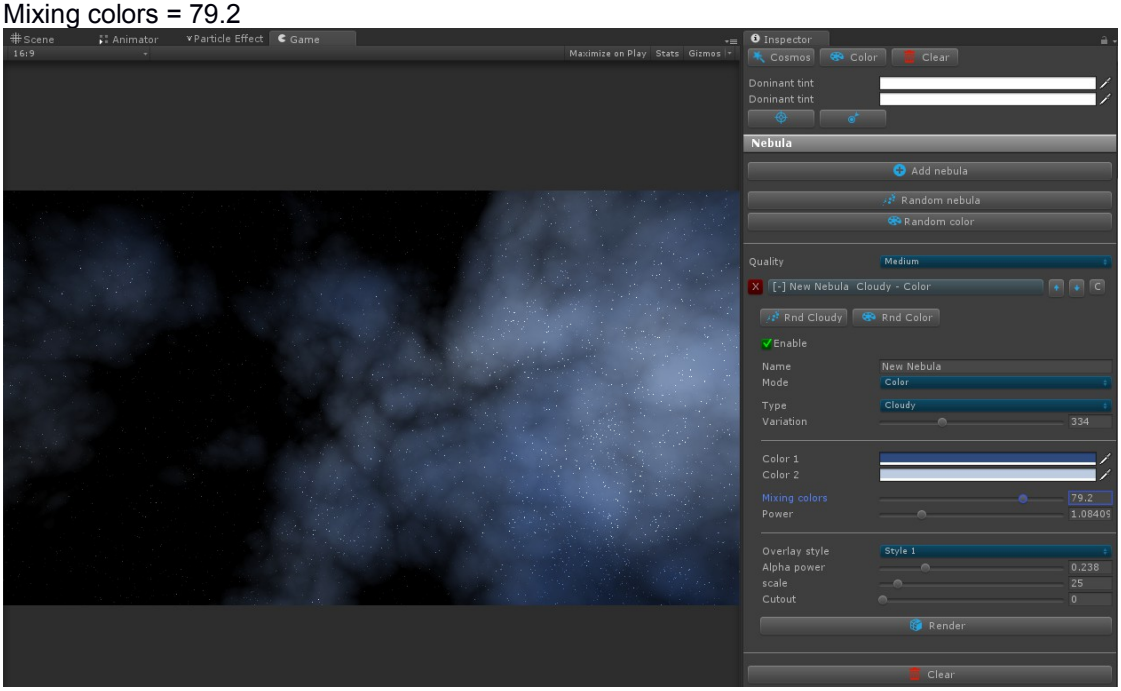
Small value: little mixing
Great value: many mixing

Example

Mixing colors = 12.7



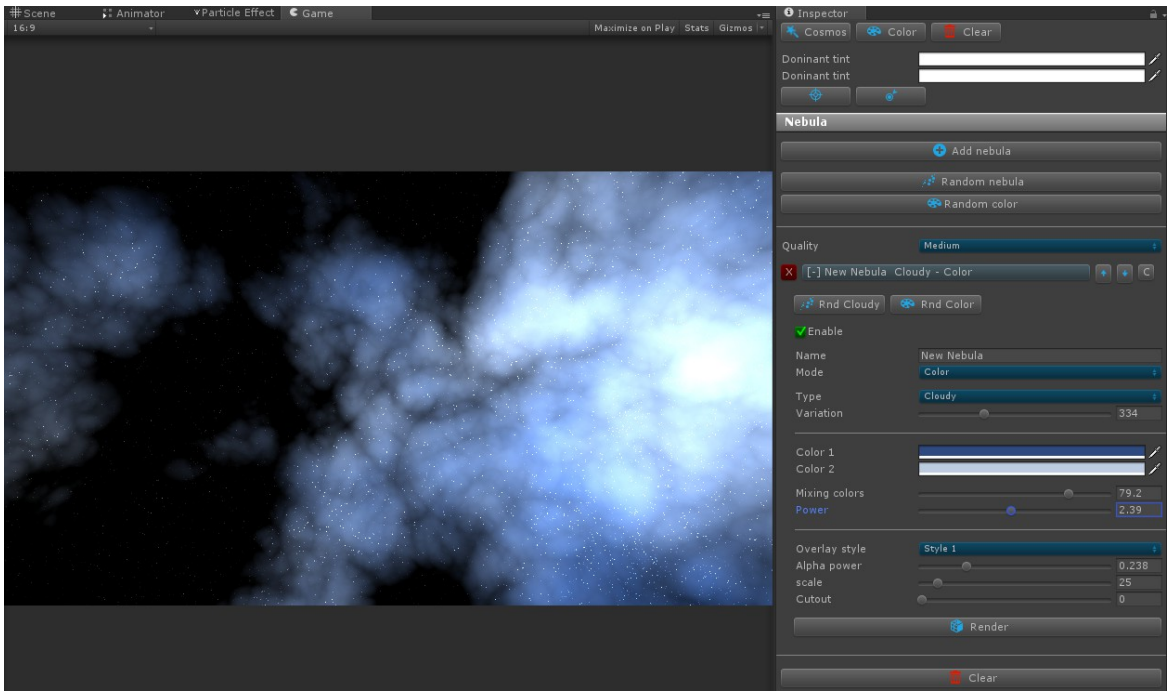
Mixing colors = 79.2



Power

The color intensity

Example
The same nebula as above but with a power greater = 2.39 instead of 1.08



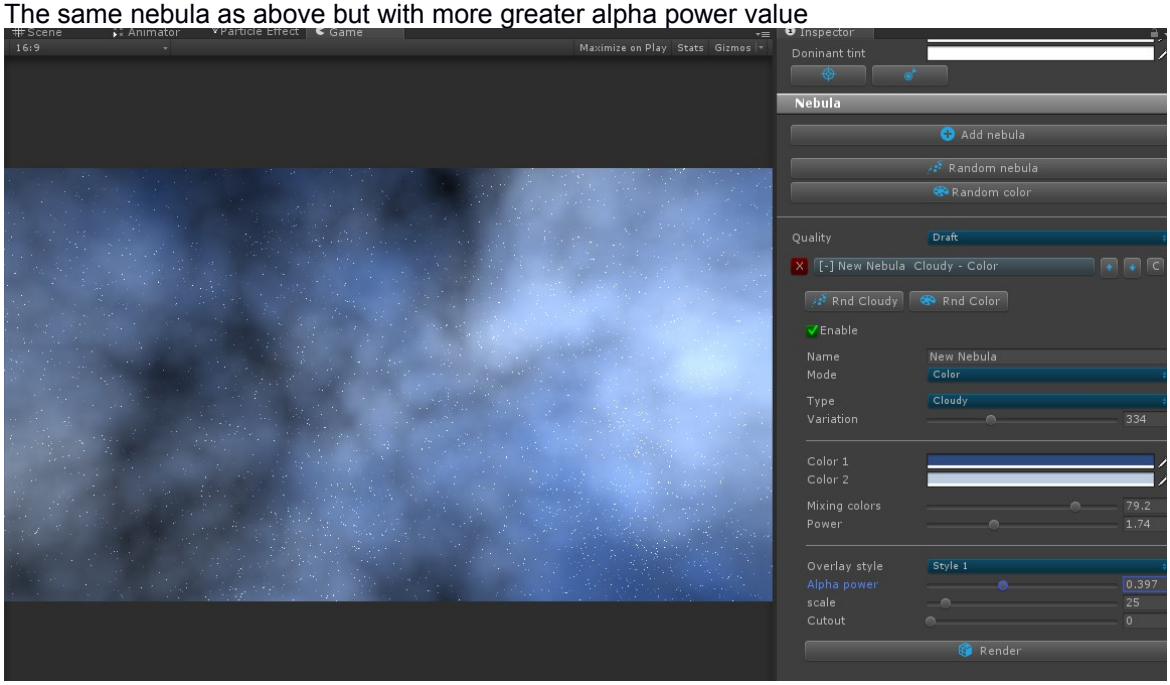
Overlay style

Refer to Chapter Nebula Type

Alpha power or Power Illumination

Example

The same nebula as above but with more greater alpha power value

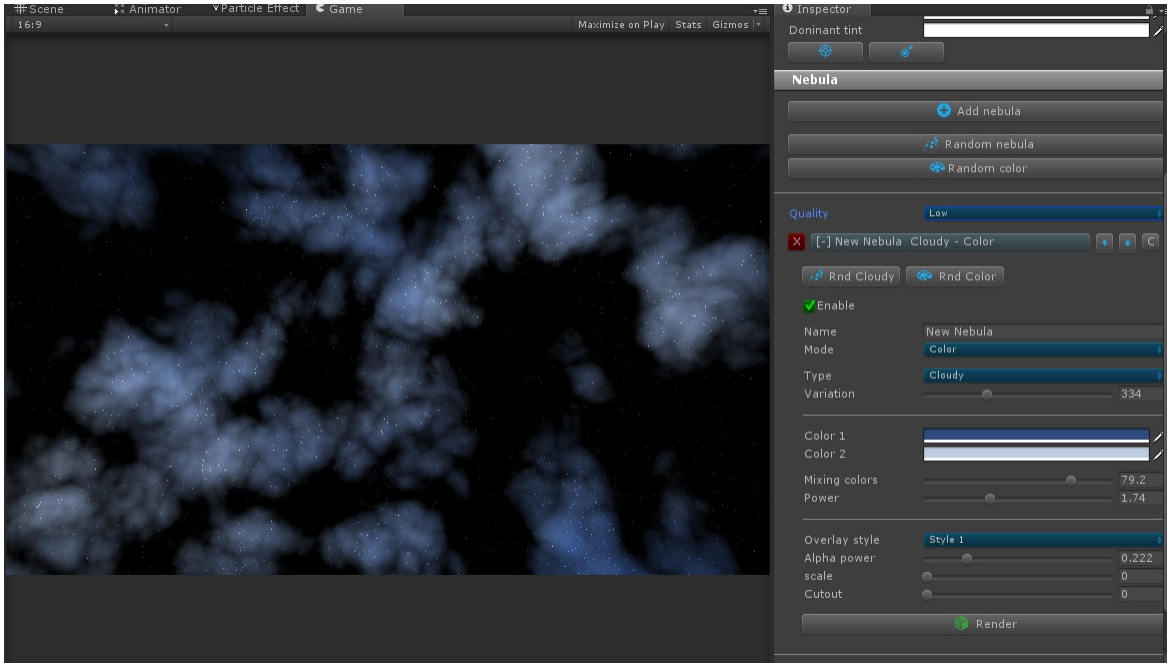


Scale

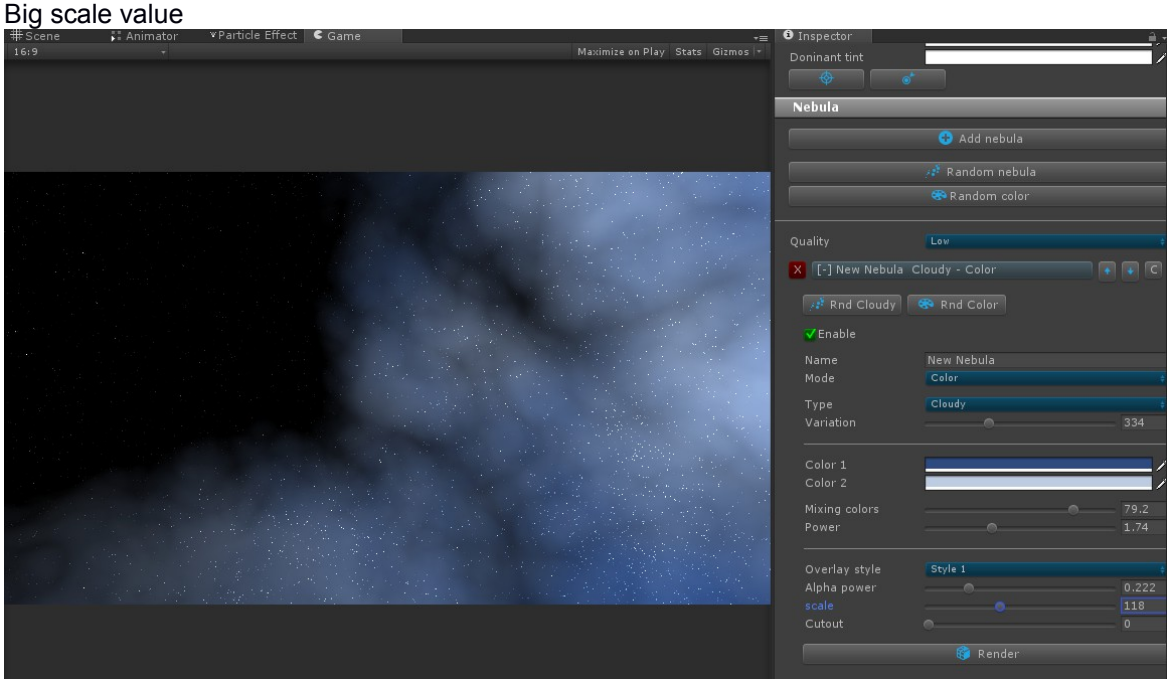
Set the size of cloudy effect

Example

Small scale value



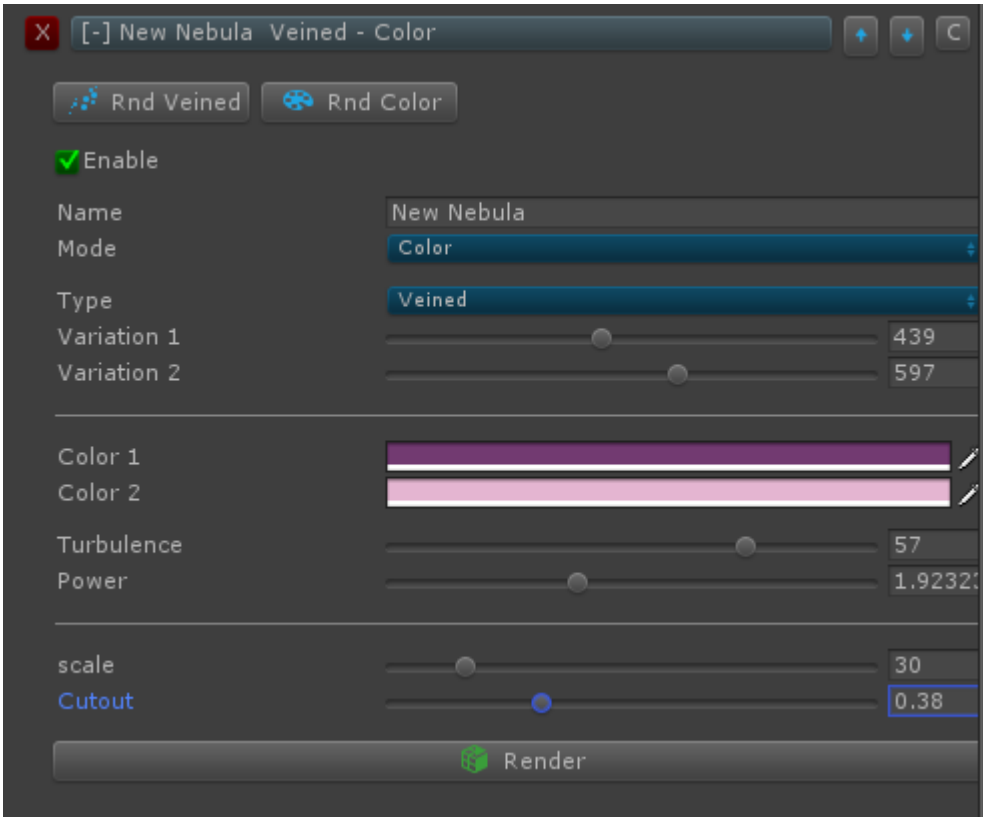
Big scale value



Cutout

CutOut operates a rendering based on the value

Veined nebula



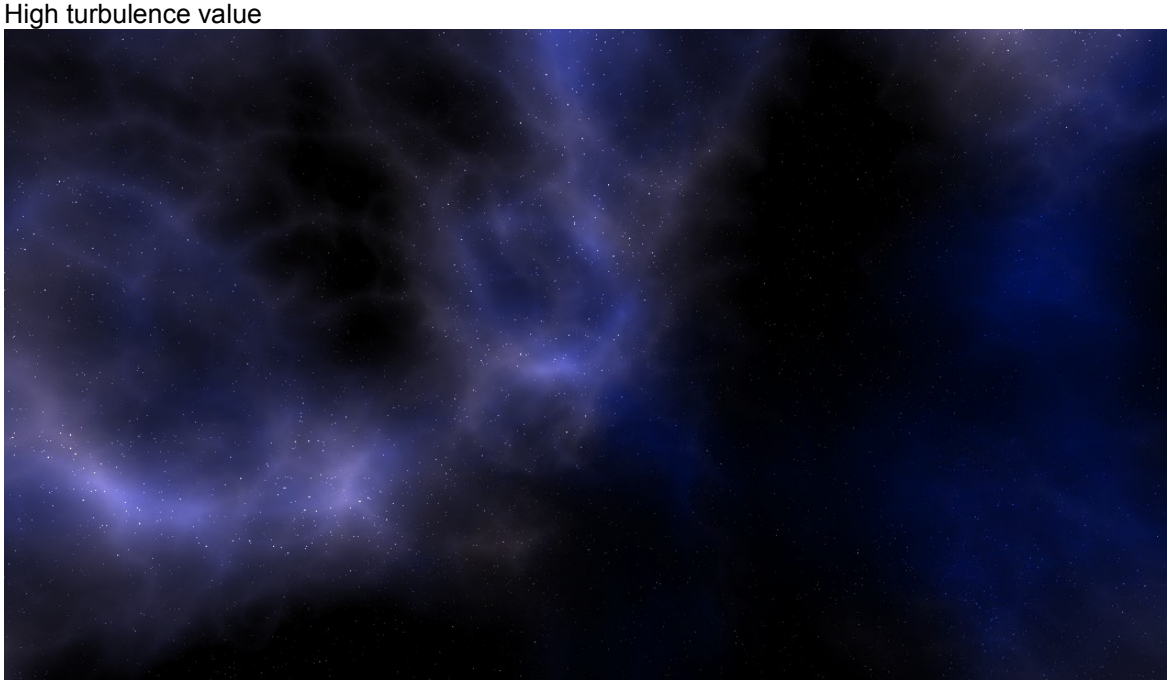
All properties are identical to cloudy nebula, only one parameter differs

Turbulence

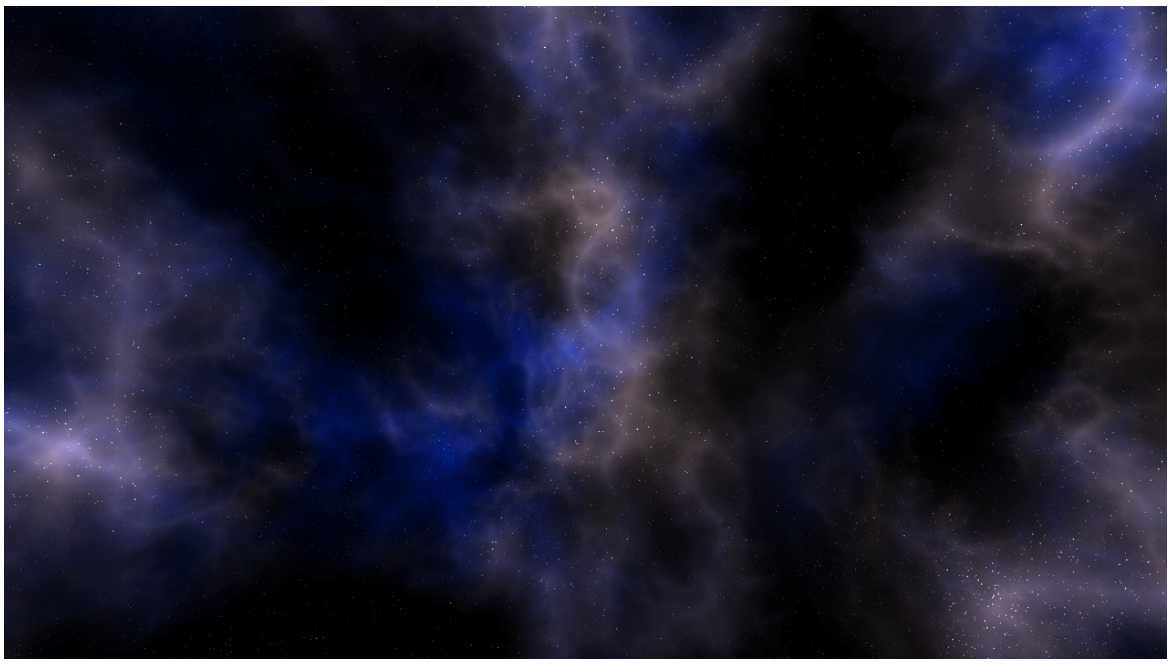
Defined the level of turbulence in the nebula

Example

High turbulence value



Low turbulence value



Starfield

The starfield are divided into two layers Cosmos & Nebula.

One applies to the "black" parts, and the other on nebulae. The stars are generated for the cosmos are in color mode, and for nebula are in additive.

Random star field (button)

Random generation of starfield.

Quality

There are 2 levels of quality (Medium and High). By default quality is set to High.

Enable

Enables or disables the starfield.

Star cluster

Set the number of star cluster.

Mixing

Defined the distribution of stars between the groups and background.

Gradient

Defined the gradient, in which a color is chosen randomly for a star.

Intensity

Set the intensity of the stars.

Threshold

Set the threshold penetration of a layer in the other.

Small / Medium / Large

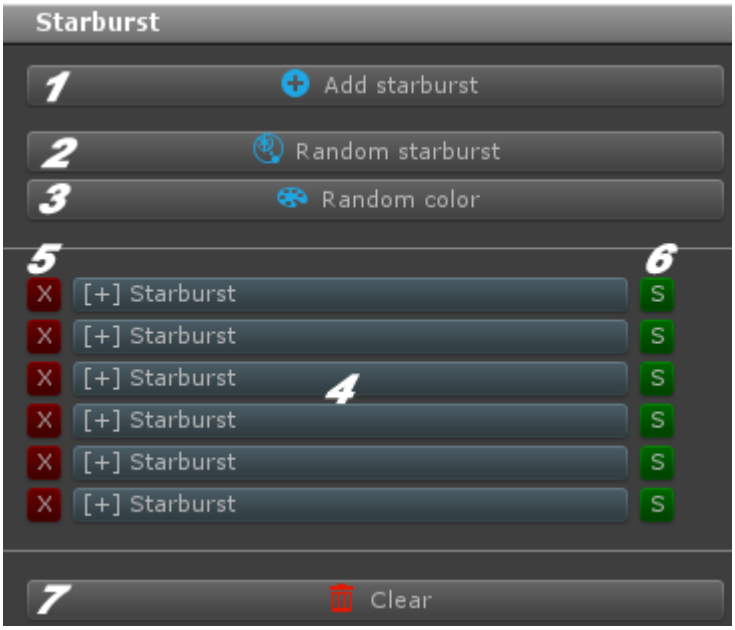
Set the number of stars of each size.

Clear (button)

Clears the texture.

Starburst

The starburst allow you to add detail where you want.



(1) Add starburst

Adds a starburst.
The scene view camera is automatically positioned at the center and look at to the new starburst.

(2) Random starburst

Generates randomly starburst, which replaces the existing ones

(3) Random color

Colorize all existing starburst, depending on rules of dominant color

(4) List of starburst

Each line can be unfolded to access the different parameters of the starburst.
More detail on starbust properties here

(5) Delete the starburst

(6) Select the starburst

The scene view camera is automatically positioned at the center and look at to the starburst.

(7) Clear

Clear all starburst.

Starburst properties

The starburst uses the shader Nebula

Color

The colors that will be used by the shader

Power

The color intensity

Texture

Texture to show.

Size X & Y

The starburst size.

Rotation

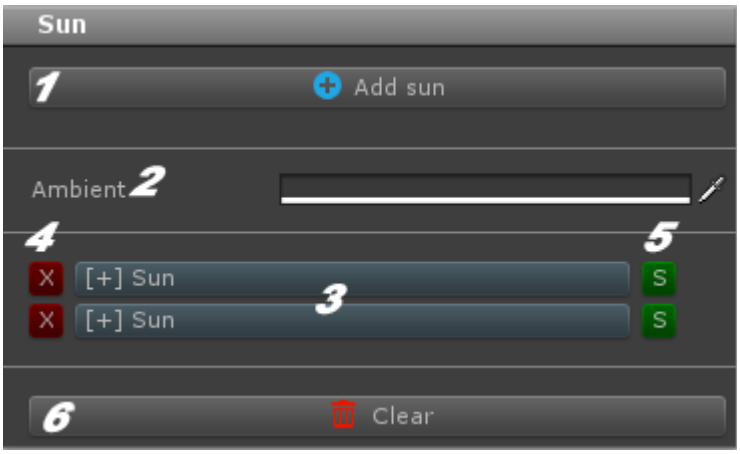
The starburst rotation.

Longitude & Latitude

The position on the celestial vault. When you change these values, the scene view camera tracks your movement.

Sun

The sun represents the light sources in your scene, you'll need at least one sun in your scene. At the creation of the cosmos, one sun is automatically created.
A sun is composed of 1 Directional light , and 1 point for lensflare effect.



(1) Add sun

Adds a sun.
The scene view camera is automatically positioned at the center and look at to the new sun.

(2) Ambient

Set the ambient of the scene.

(3) List of sun

Each line can be unfolded to access the different parameters of the sun.
More detail on sun properties here

(4) Delete the sun

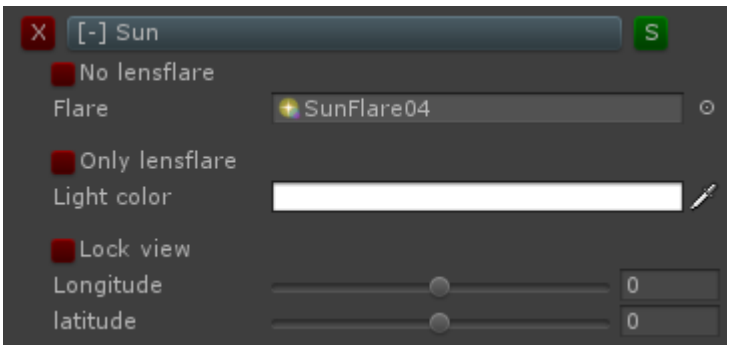
(5) Select the sun

The scene view camera is automatically positioned at the center and look at to the sun.

(6) Clear

Clear all sun.

Sun properties



No lensflare

Disable point light that supports the lens flare.

Flare

The lensflare object.

Only lensflare

Disable the directional light.

Light Color

Color of directional light.

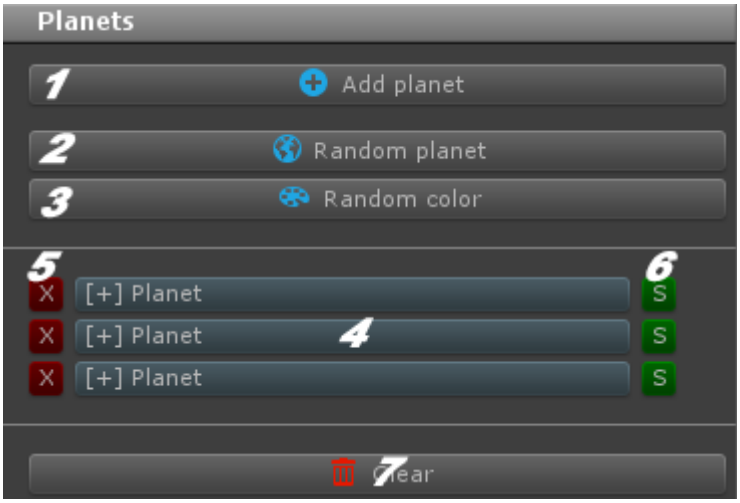
Longitude / Latitude

The position on the celestial vault. When you change these values, the scene view camera tracks your movement.

Lock view

Disable the track, if you want to set position of your sun on global view.

Planet



(1) Add Planet

Adds a new planet on your scene.
The scene view camera is automatically positioned at the center and look at to the new sun.

(2) Random planet

Adds a random number of planet, by replacing the existing one.

(3) Random Color

Colorize all existing planet, depending on rules of dominant color.
Colorization takes on atmospheric effects.

(4) List of planet

Each line can be unfolded to access the different parameters of the planets.

(5) Delete

Delete the planet.

(5) Select the planet

The scene view camera is automatically positioned at the center and look at to the planet.

(7) Clear

Clear all planets.

Planet general properties

Render to skybox (Unity Pro only)

You can choose to include or not the planet into the final skybox result.

Name

The name of the planet, it is very useful to select it in the case of mass creation or orbital rotation.

Material

The material used by the planet and its parameter (only with the shader applied by default).
More detail here

Ring

The property of the ring of the planet.
More detail here

Position & size

The position on the celestial vault, and size.
More detail here

Auto rotation

The rotation parameter, or orbital rotation. If an option is selected the option "render skybox" is automatically deselected
More detail here

Material

By default the planets are created with the shader Planet BA

It will display the properties associated with this shader only.

Material

The material uses on the planet.

Ambient

Enables or disables the ambient light on planet

Diffuse/Normal

The textures

Power diffuse

Hardness between lighting and shading.

Internal Atmosphere

Enables or disables internal atmosphere effect

Full bright

Enables or disables light on atmosphere.

Color

Atmosphere color.

Power

Atmosphere intensity.

Size

Atmosphere size

External Atmosphere

Enables or disables external atmosphere. The external atmosphere is another object child of the planet.

Full bright

Enables or disables light on atmosphere.

Color

Atmosphere color.

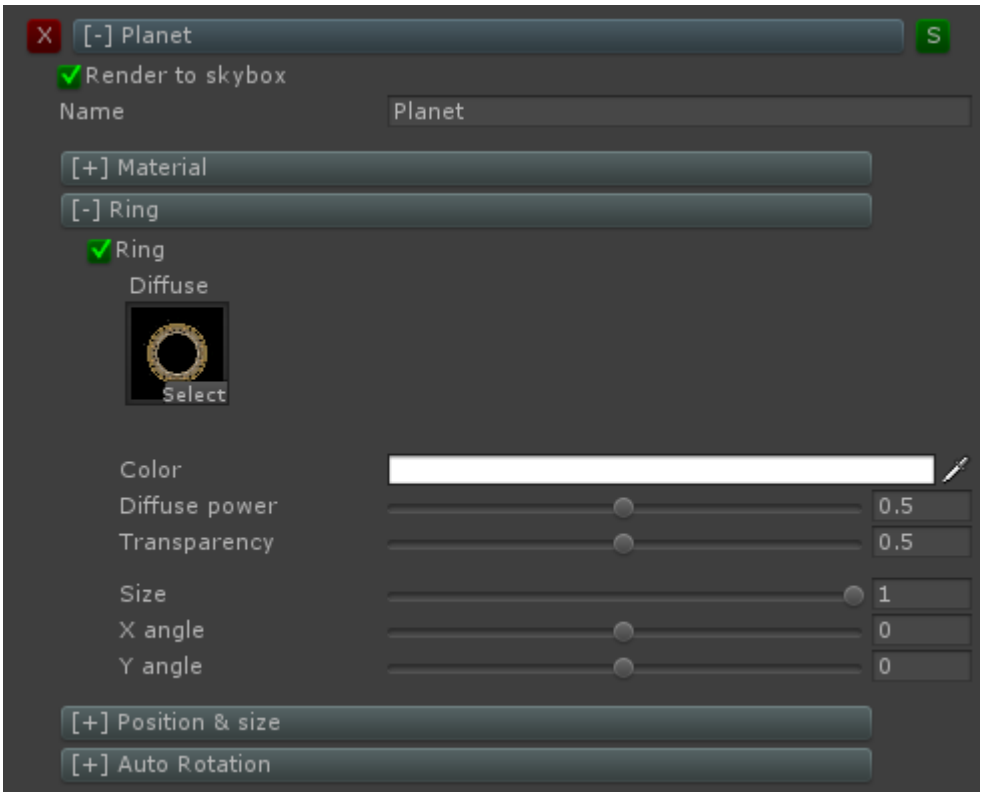
Falloff

Atmosphere intensity.

Size

Atmosphere size

Ring



Ring

Enables or disables ring object on the planet.

Diffuse

The texture for the ring.

Color

Ring color.

Diffuse power

Color intensity.

Transparency

Ring transparency.

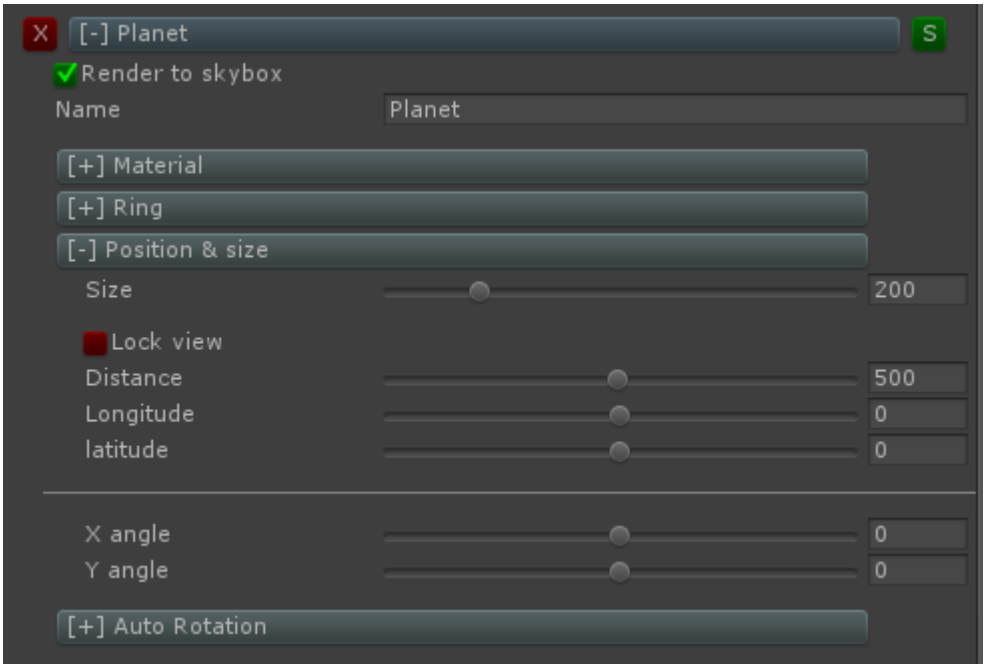
Size

Ring size.

X & Y angle

Inclination angle of of the ring.

Position & Size



Size

Planet size.

Lock View

Disable the track, if you want to set position of your sun on global view.

Distance

Distance from the center of cosmos.

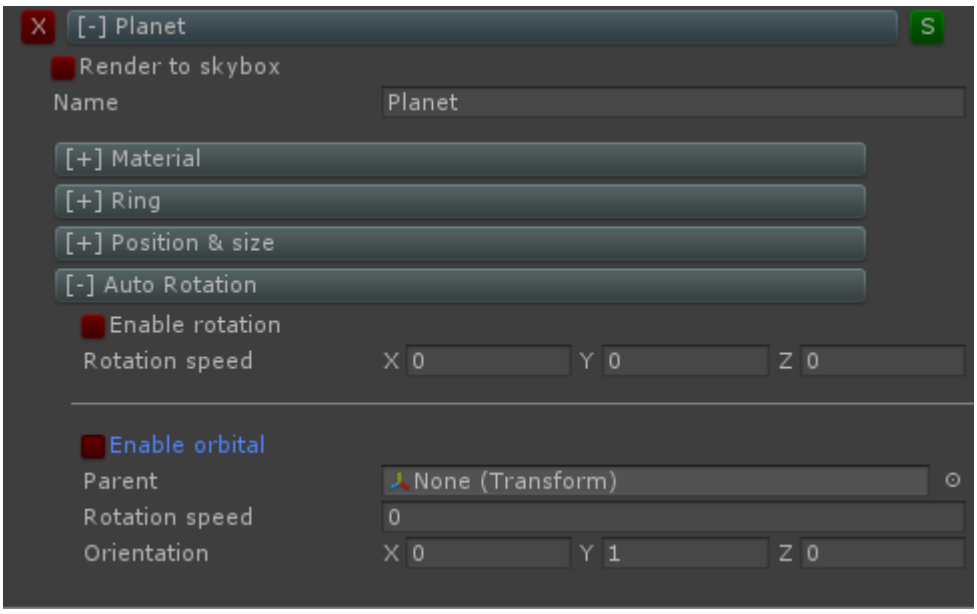
Longitude / Latitude

The position on the celestial vault. When you change these values, the scene view camera tracks your movement.

X & Y angle

Inclination angle of of the ring.

Auto rotation



Enable rotation

Enables or disables self rotation.

Rotation speed

Rotation speed on each axis.

Enable orbital

Enables or disables orbital rotation.

Parent

Transform of the object around which the planet will turn.

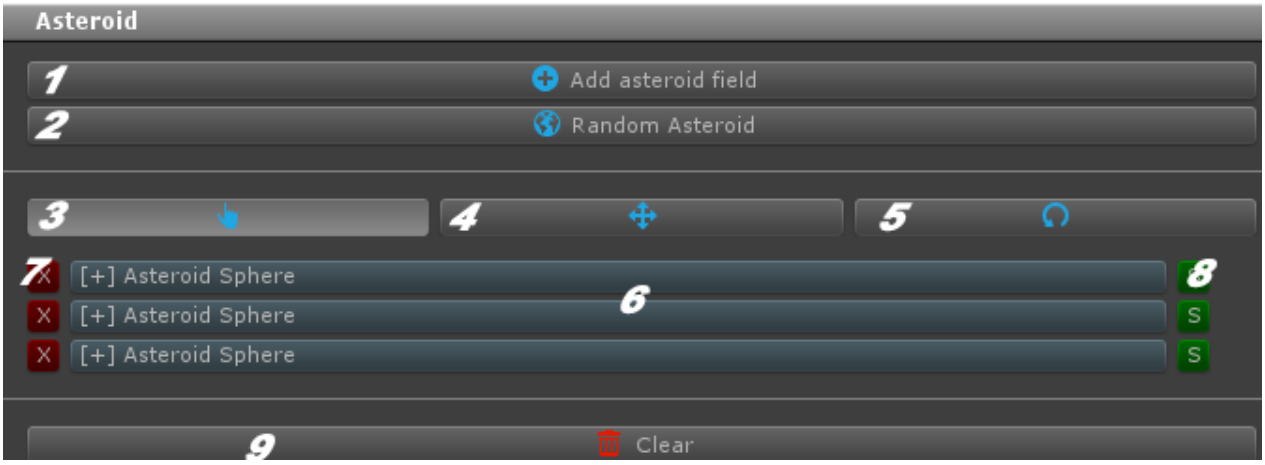
Rotation speed

The rotation speed.

Orientation

Orientation relative to the parent, during rotation.

Asteroid or Mass Creation



(1) Add asteroid field

Adds a new mass creation on your scene.

The scene view camera is automatically positioned at global position and look at to the new mass creation.

(2) Random asteroid

Create a random global asteroid field.

(3/4/5) None, Move, Rotation Tool

Allow you to manipulate the mass creation.

(6) List of mass creation

Each line can be unfolded to access the different parameters of the mass creation.

(7) Delete

Delete the mass creation

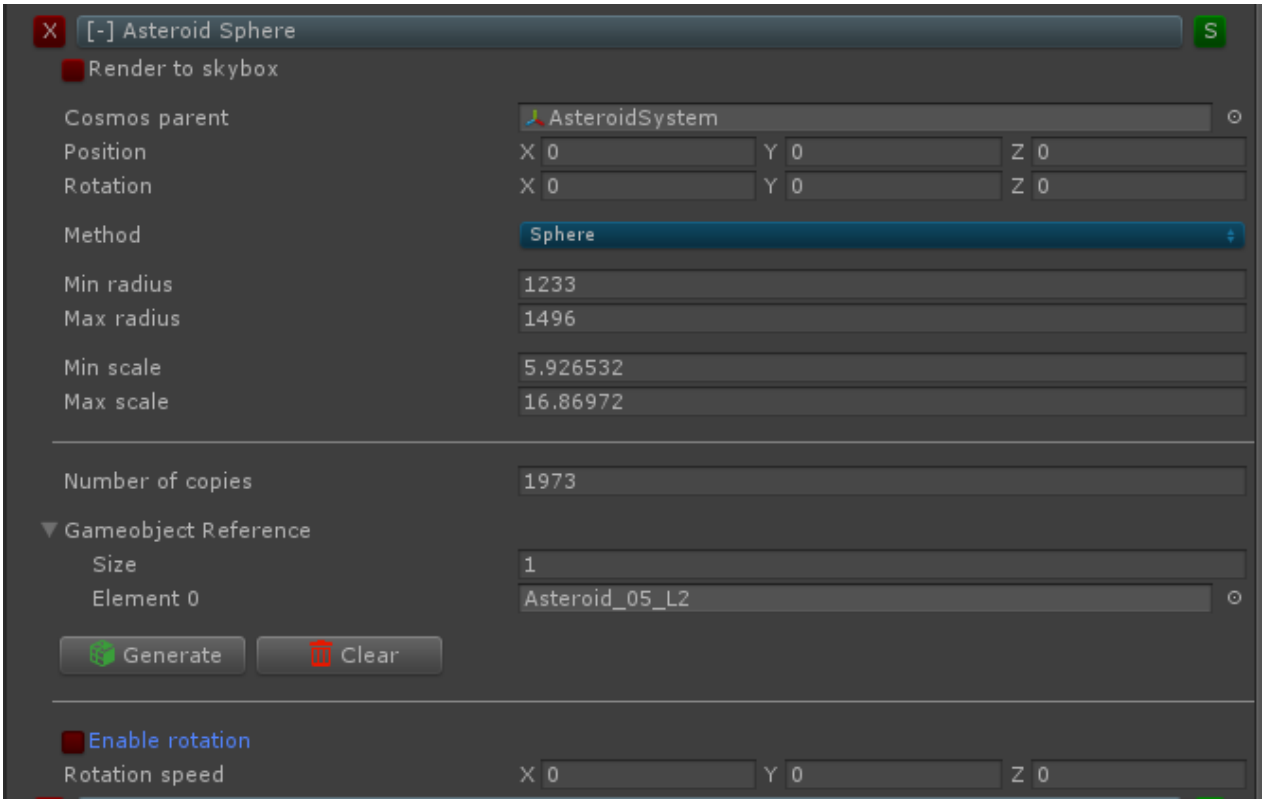
(8) Select the mass creation

The scene view camera is automatically positioned at global position and look at to the mass creation.

(9) Clear

Clear all mass creation

Properties



Render to skybox (Unity Pro only)

You can choose to include or not the result of the mass creation into the final skybox result.

Cosmos parent

By default the mass creation it's creating at the center of cosmos, but you can attach the mass creation to a planet for example.
When you assign a parent, the mass creation is automatically positioned at the center of the parent.

Position/Rotation

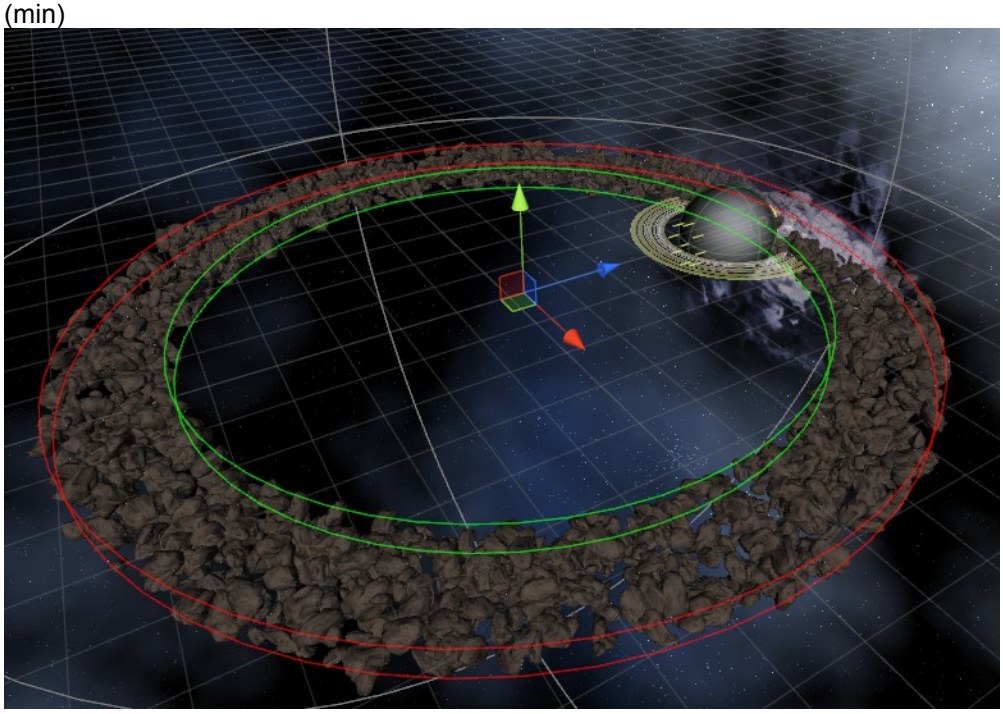
Transform data of the mass creation

Method

You have choose between Sphere and Ring

Min & max radius

Radius of the area. These values are represented in the scene by the red (max) and green color (min)



Height

Height of the area for ring method.

Min & Max scale

Allows the assignment of a random size between two values.

Number of copies

The number of copies that will be create.

GameObject reference

A dynamic array to reference the objects that will be randomly selected during the generation.

Generate (button)

Generate the objects relative to the setting.

Clear (button)

Clear all child objects.

Enable rotation

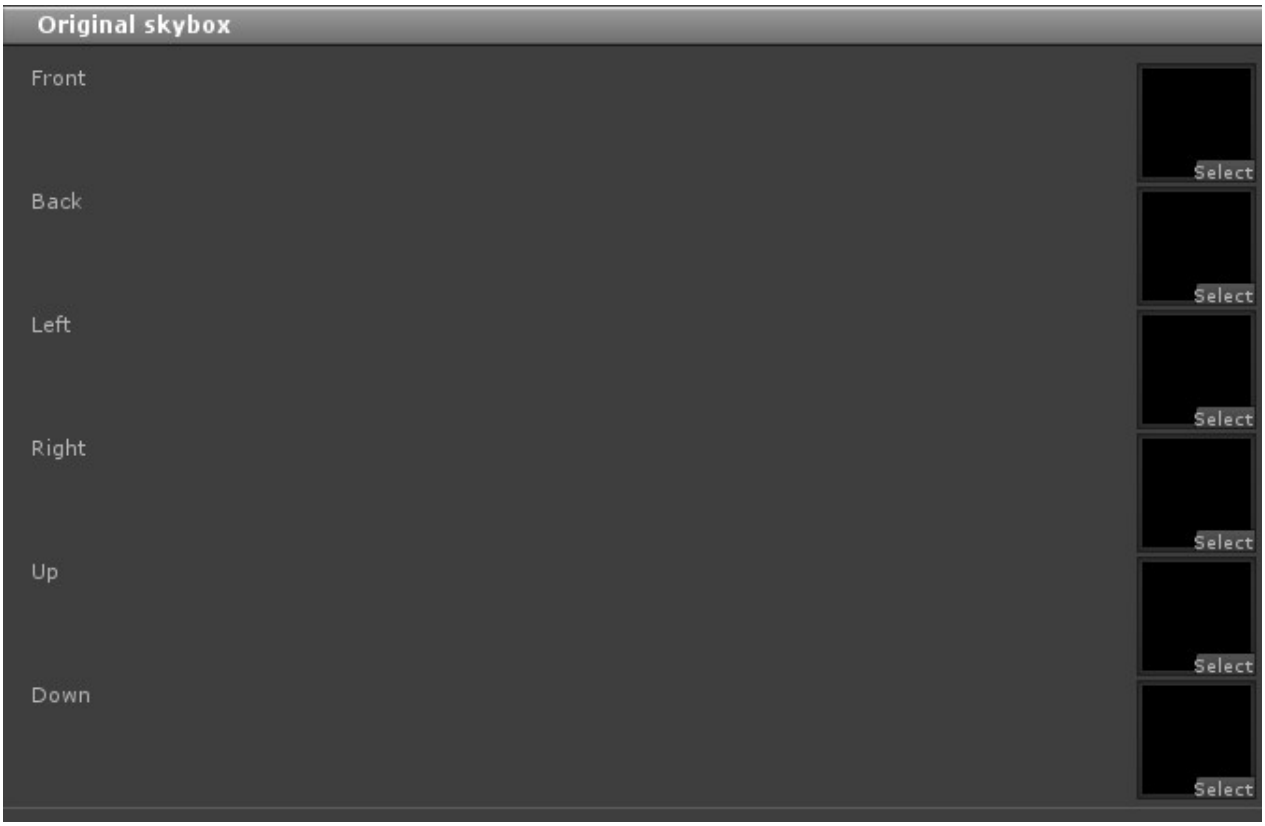
Enables or disables self rotation.

Rotation speed

Rotation speed on each axis.

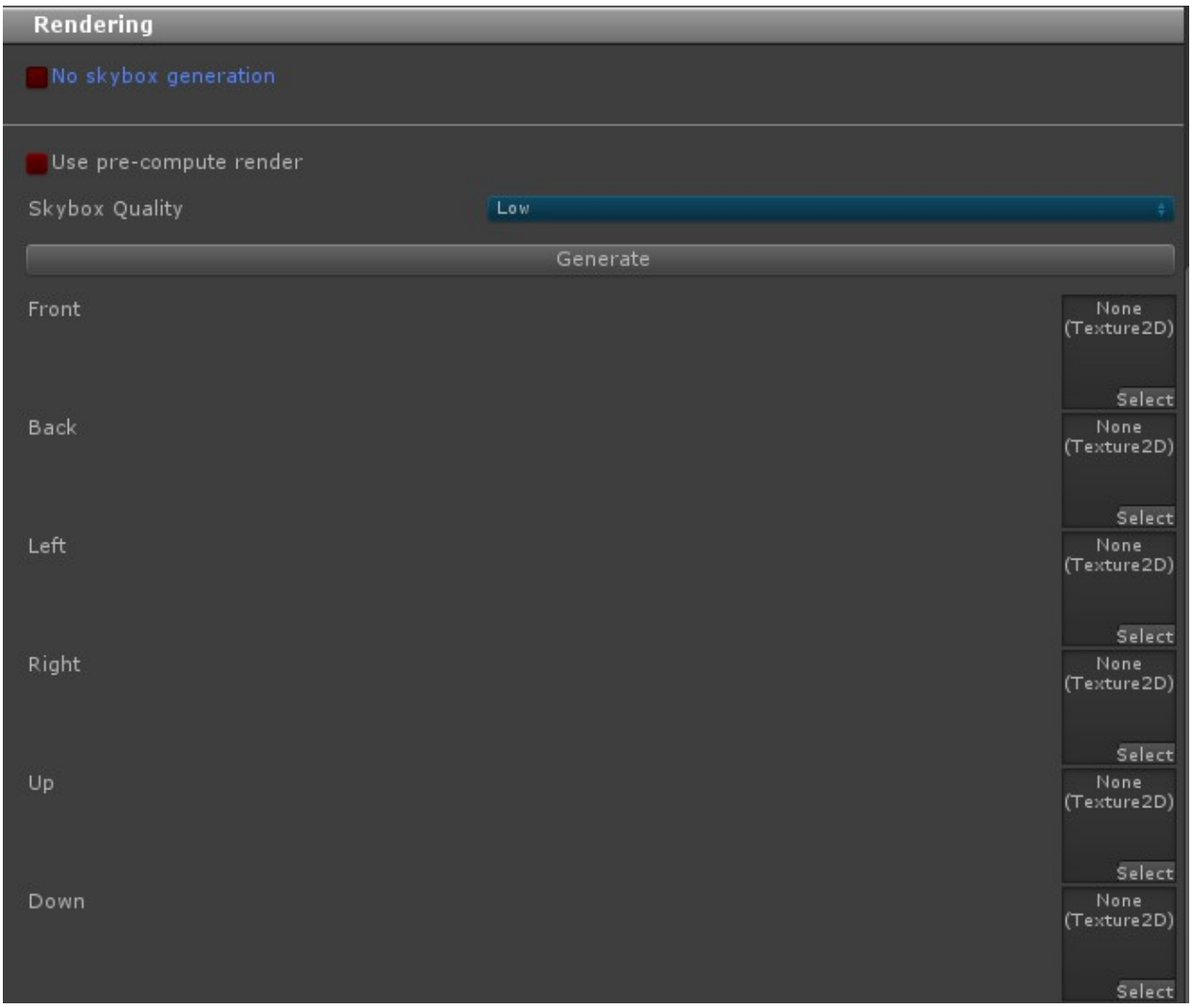
Original skybox

If you wish to complete an existing skybox.



Rendering options

This section is accessible only owner of Unit Pro version



No skybox generation

If you don't want to use skybox rendering for your scene, it is the operation for Unity Free.

Use pre-compte render

If you don't wish to render the skybox is done at application startup. (Don't forget to generate a render).

Skybox Quality

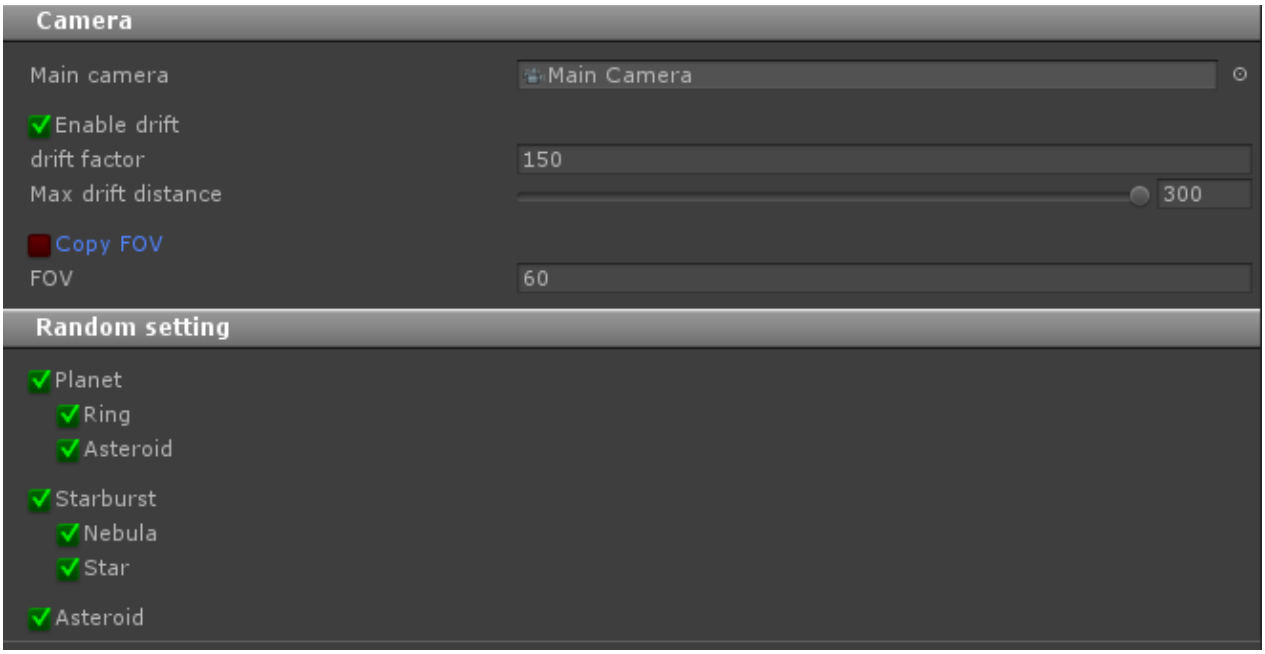
If you use the dynamic rendering or pre-calculate, it indicates the level of quality

low =512
Medium 1024
Hight 2048
ultra 4096

Generate

Launch the skybox generation that will be used in pre calculation method.

Setting



Main camera

The main camera of your scene.

Enable drift

Enables or disables drift for the dynamic camera.

Drift factor

Drift speed.

Max drift distance

The maximum drift distance.

Copy FOV

Enables or disables the copy of FOW from main camera to dynamic camera.

Random setting

Enables or disables some element for the random cosmos generation.