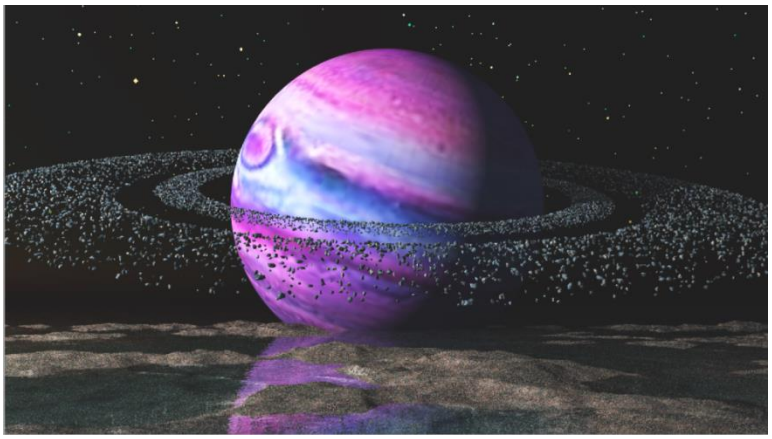
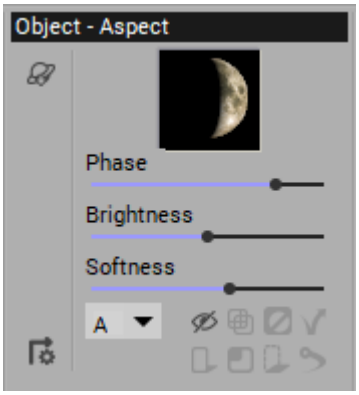
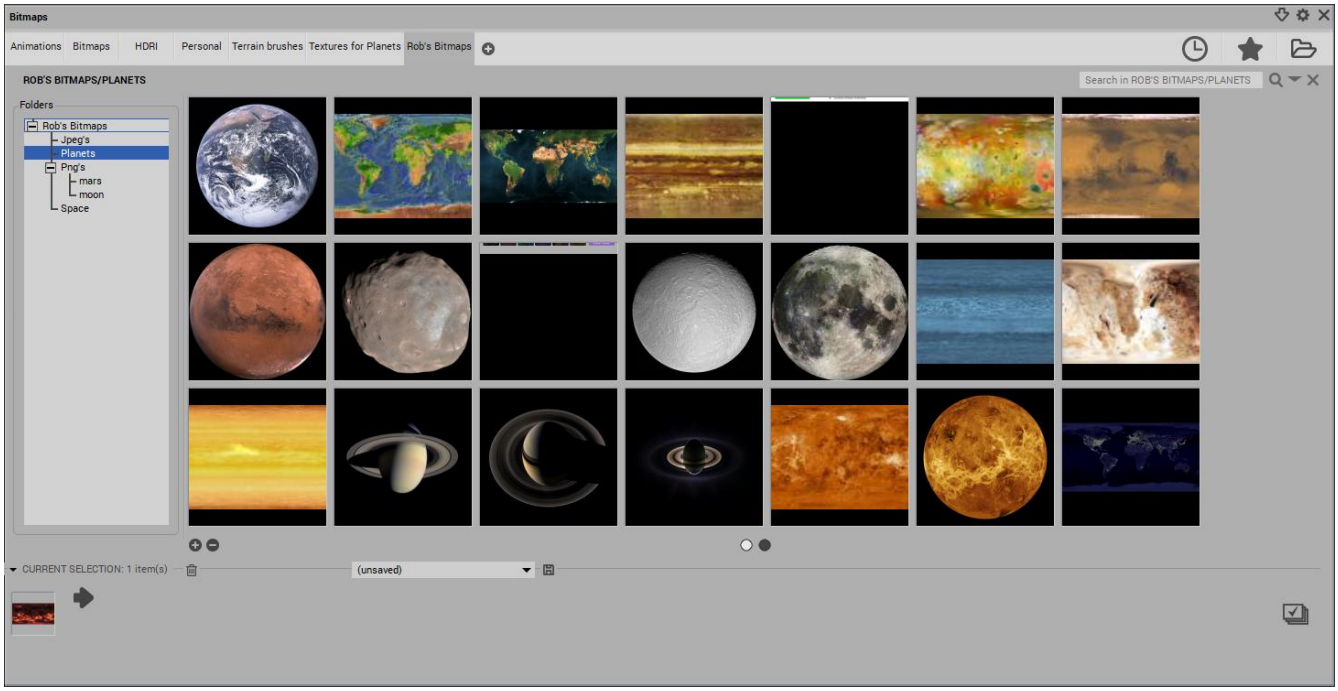
Creating Custom Planets & Spherical Scenes



Planets from the Vue Planet Icon:



Vue has an icon for the creation of the solar system planets complete with some basic controls over such parameters as Phase, Brightness and Softness.
These planets use default models of only the Solar System planets. The planet object is a simple, two-dimensional plane that is placed perpendicular to the main camera. The plane can be resized and moved around in the scene.
If you ask for the **Custom** planet it will open the **Bitmaps** selection window from which you can select a circular or rectangular bitmap to apply to the planet surface. Both will be properly applied.



Because a Vue planet is a simple 2-dimensional illustration, it is best used for viewing at a distance as there will be no atmosphere, surface displacement or highlighting effects available in the simple Planet object in Vue.

The Planets are placed beyond the atmospheres cloud layer and thus appear to be at an infinite distance.

Using a Sphere object: 

Instead of using a Vue Planet Object, a Vue Sphere object can be used as well. The Sphere allows for much more adjustment of the planets parameters.

Open Vue with all the default settings of the “Empty” new scene.
Select the Sphere icon to load a single sphere into the scene.

Adjust the camera position & angle and move the sphere upward to place in the scene just above the ground plane.

Highlight the **Sphere** item in World Browser and change its name to **Planet**.

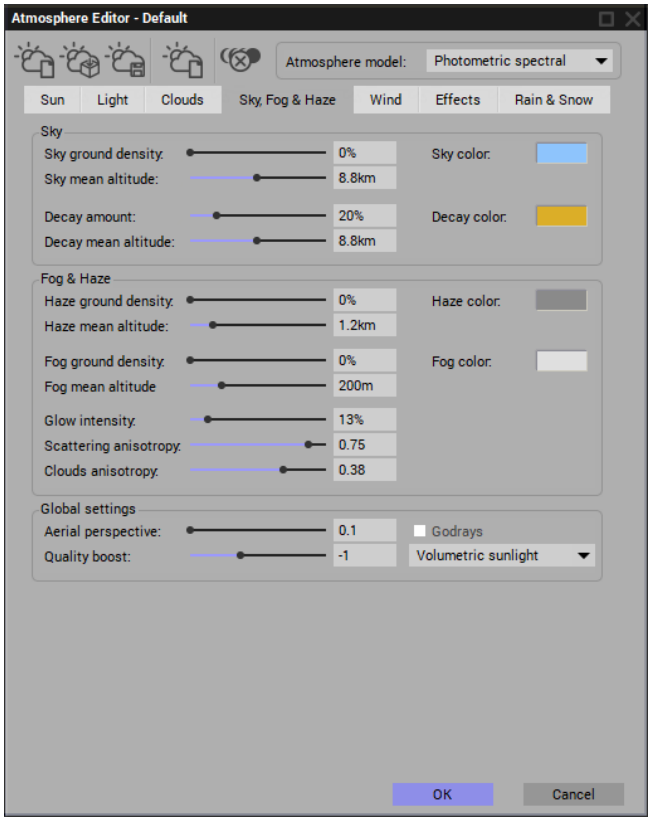
We would like to work with the planet in a clean state. Right now the colour of the planet material has some variations in it. We want to change this to flat white colour.

Click on the **Load Materials** icon in the **Object - Aspect** panel:  From the displayed Materials window, select the **Basic** tab and then select the **Flat white** material.

Placing the Planet into Space

One of the ways to put the planet into a Space-like environment is to left-click on the **Atmosphere Editor** icon:  and select the **Sky, Fog & Haze** tab in the displayed window.

Set the **Sky ground density**, the **Haze ground density** and the **Fog ground density** all to 0%.



Note that the planet is still lit by a sun though the sky is now black. Actually, **Global Radiosity** effect is causing the shaded side of the planet to still have some lighting.

Under the **Light** tab, set the **Lighting model** from **Global Radiosity** to **Standard**.

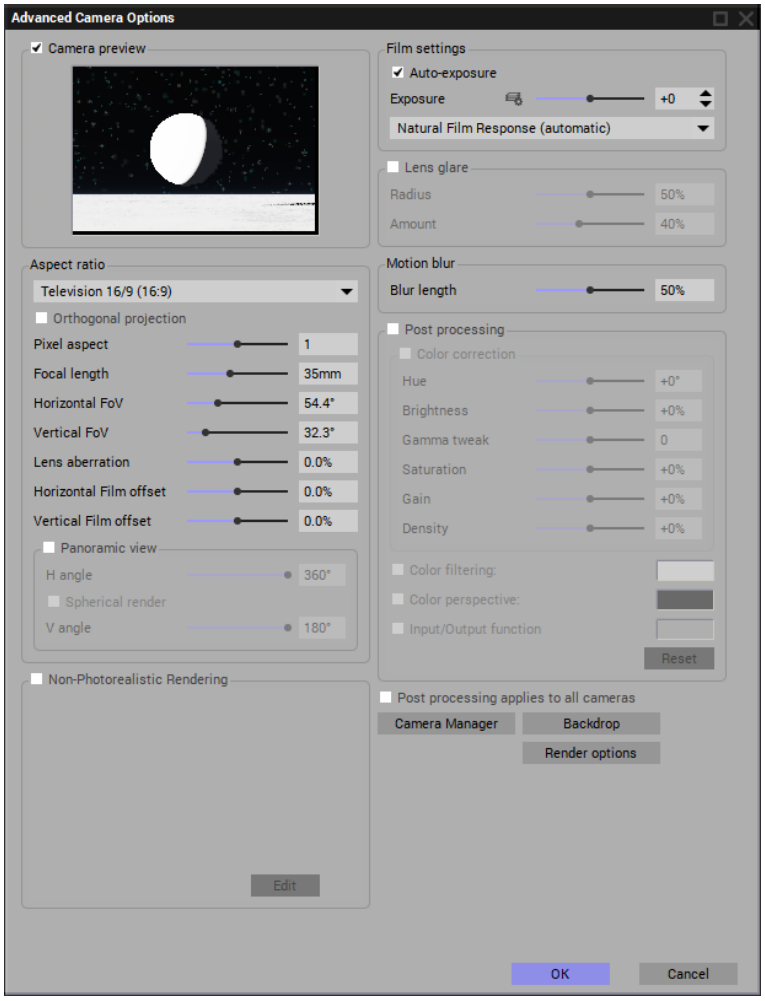
Now the unlit side of the planet is black.

Now select the **Effects** tab and set the **Stars** on. Set the **Number of stars** and Brightness to100%. Turn on Colored stars.

The placement of the Sun relative to the planet will determine the direction and phase of the planet that is seen by the camera. Set it to the left and a bit behind the planet for about ¾ phase.

A render of the scene produces a planet image that is very bright. The dark side of the planet is almost black. The stars are not too clear or bright.
We'll adjust the camera exposure a bit.

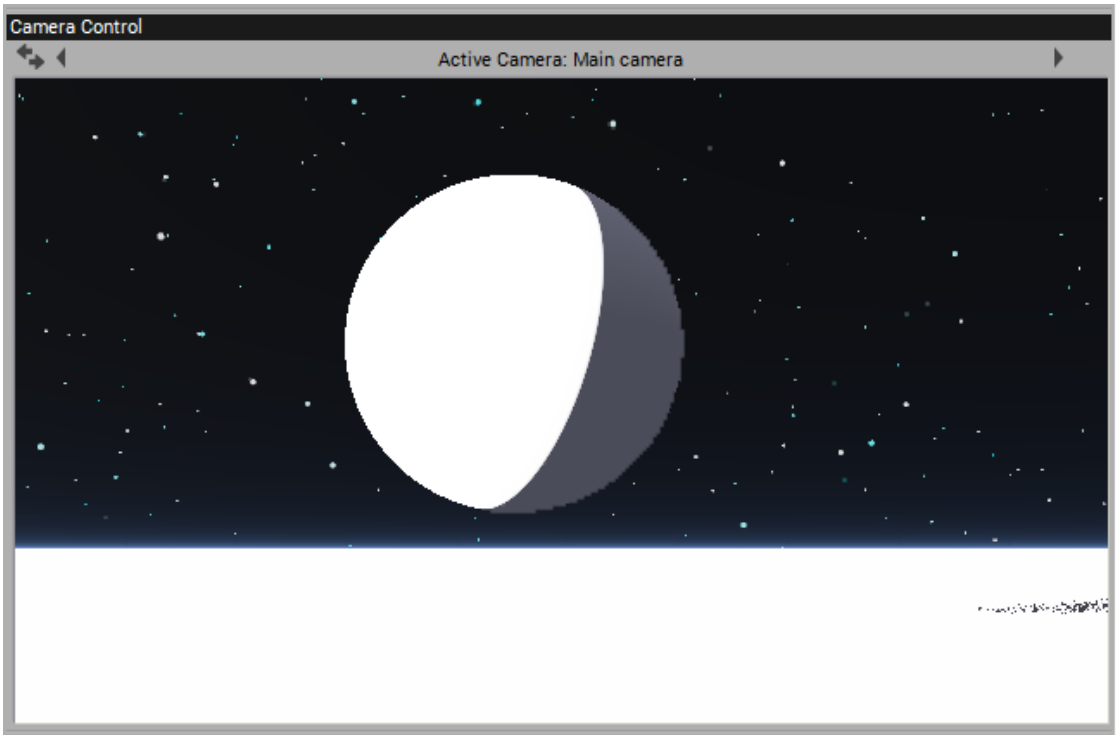
Double-click on the **Main Camera** in the **World Browser** to open the **Advanced Camera Options,**



Here you can brighten the stars and the light on the dark-side of the planet by unchecking the **Auto-exposure** box and setting the **Exposure** to +4 or +5.

But simply turning off the Auto-exposure will lessen the effect of stars. Now they are almost impossible to see. But then raising the Exposure setting will brighten them again.

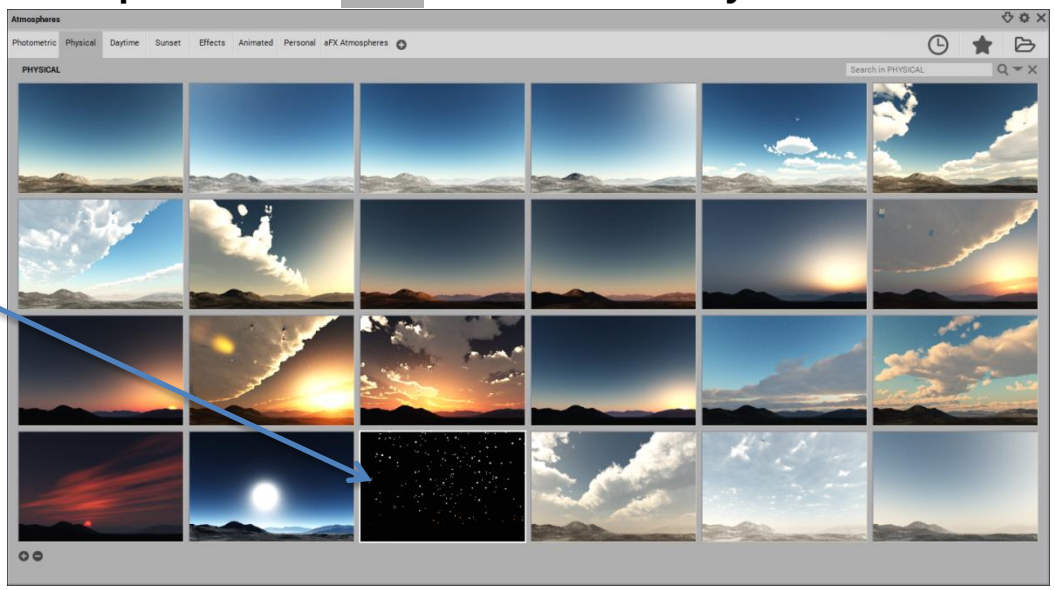
We'll try some different atmospheric models to improve the overall night sky.
But first, highlight the **Ground** in the **World Browser** and delete it.
Then move the planet higher in the sky and aim the camera to it.



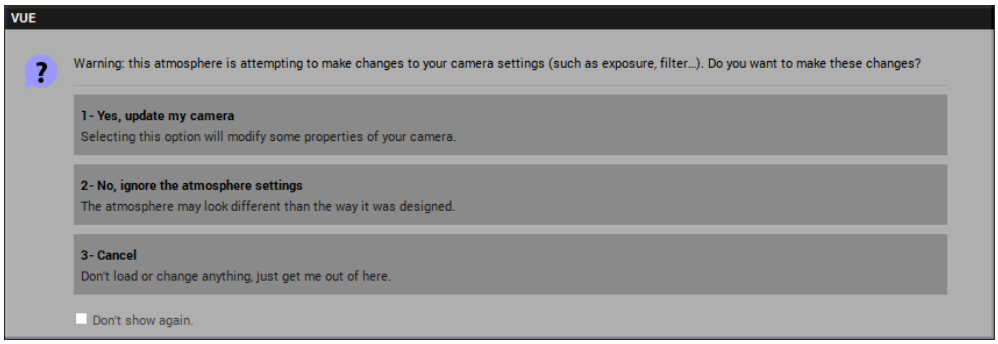
Physical Light night sky model:
The next model we will try is the **Night** model from the **Physical** group of atmospheres.

Right-click on the **Atmospheres** icon:  and select the **Physical** tab.

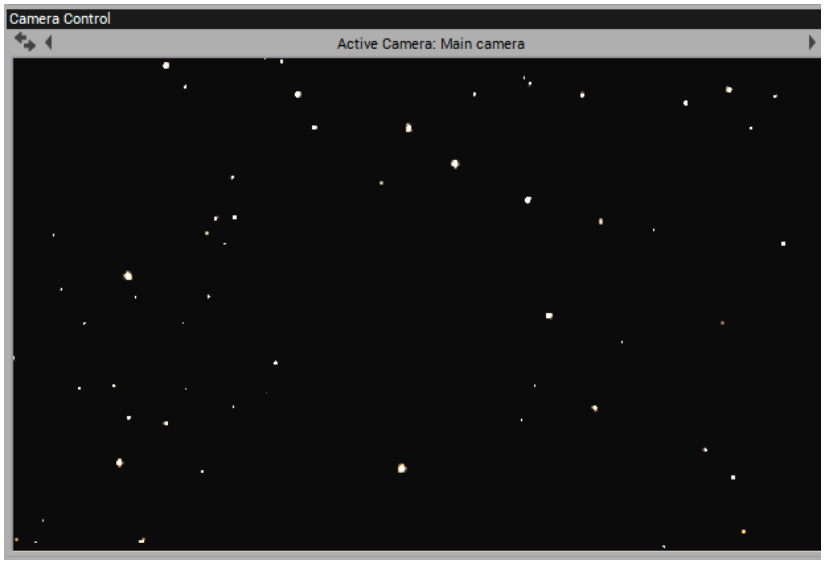
From the default atmospheres shown, select the “Night” atmosphere:



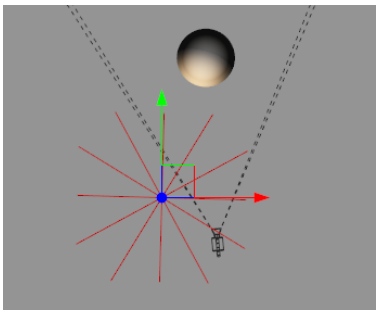
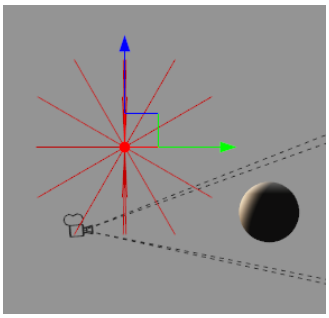
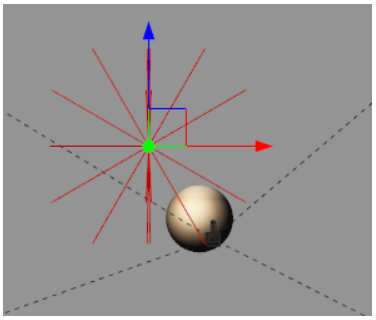
As with many new atmospheres, you will receive a warning that your camera settings will change as a result of loading this atmosphere. Click **Yes** to allow this.



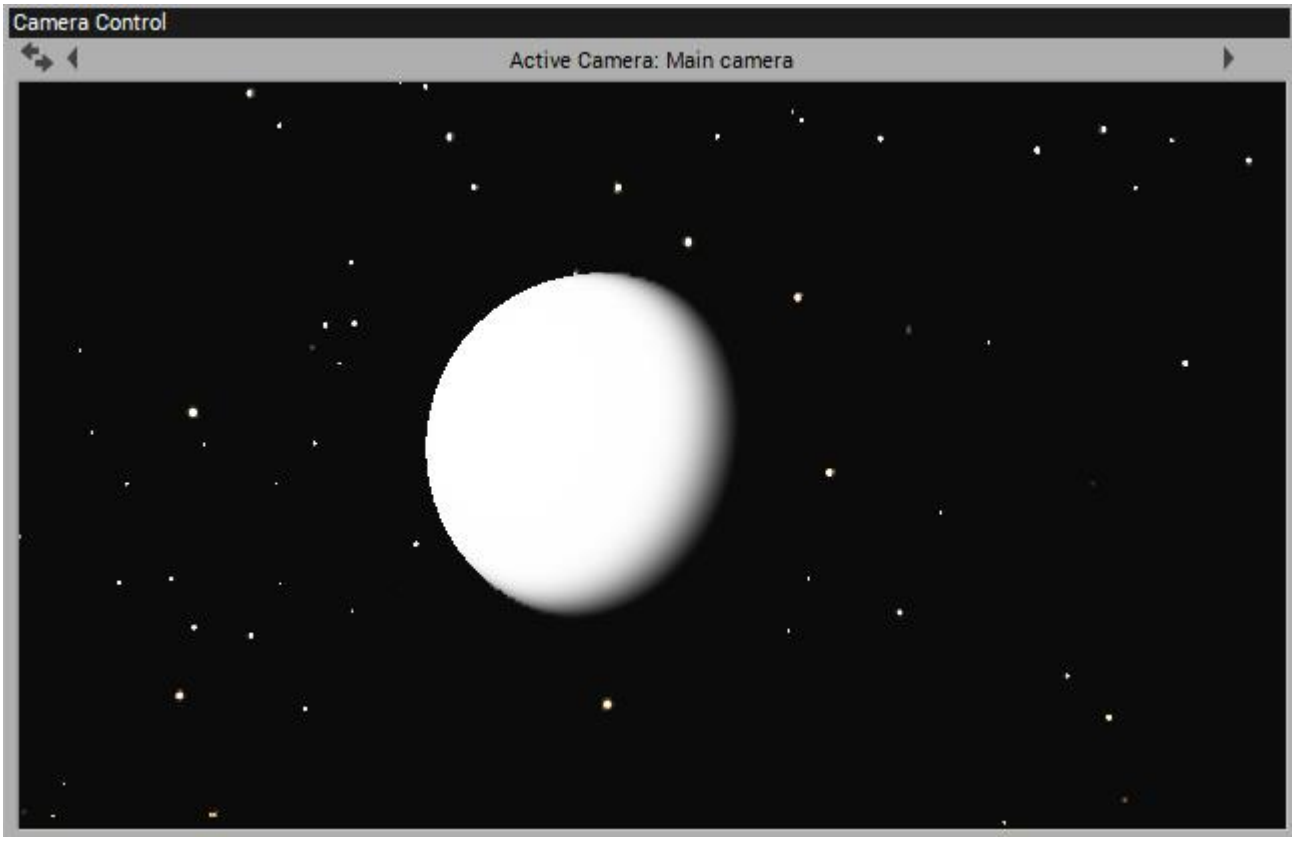
A night sky will appear with stars. The sky is completely black and the planet can’t be seen though some stars will be.



- From the left tools menu, select the **Point light** icon:  or right-click and select the first item in the list)
- In the Top, Front and Side Views, move the Point light in relation to the planet and the camera to achieve a ¾ phase lighted planet again.

The Physical Night atmosphere gives a softer light with gentler shadows



Note that this preview results from Automatic Exposure turned on. If Automatic Exposure is tuned off, the brightness of the planet and stars will depend on how high the exposure setting is placed. (from 0 to +4)

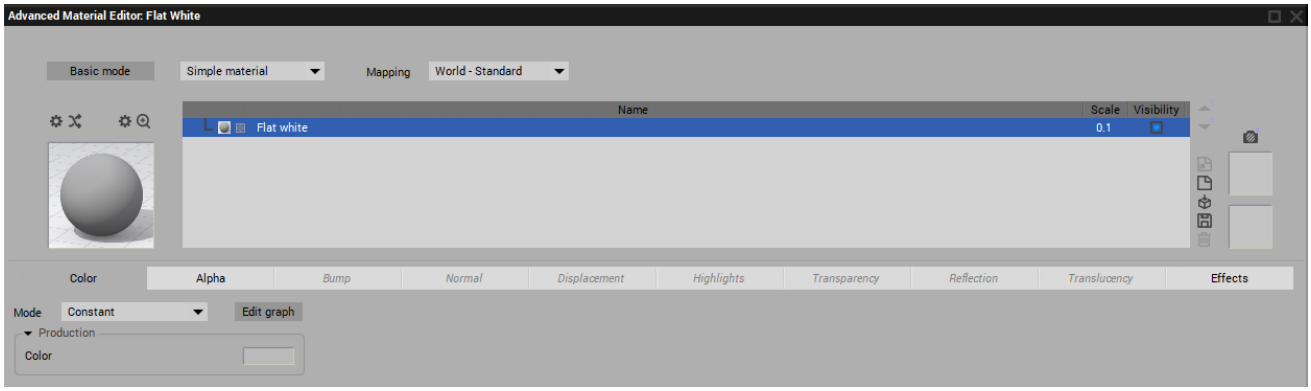
Planet Surface Colouring

There are a number of methods to achieve planet surface colouring:

- A constant colour
- Procedural Colouring
- Applying a bitmapped picture
- Natural Grain Colouring

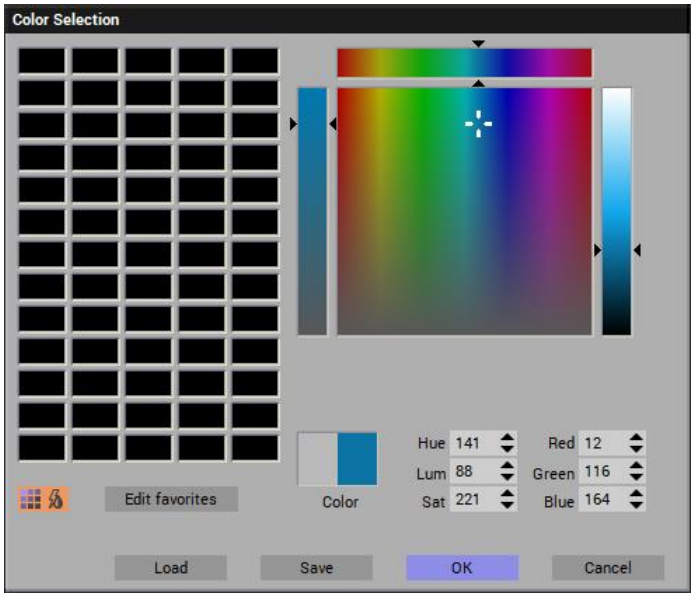
Constant Colour:
As in all the colourization methods, we begin by opening the **Advanced Material Editor**.

- ➢ Highlight the **Planet** sphere in the **World Browser** and double-click the sphere in the **Object-Aspect** window to open the planet's **Advanced Material Editor.**
- ➢ Change the **Mode** from the default **Procedural colors** to **Constant.**



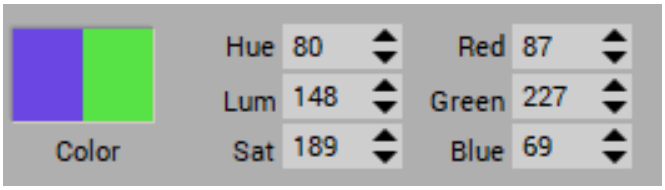
There really isn't a whole lot that can be done here except to pick the colour.

- ➢ In the **Production** section, click the **Color** box to open the colour selection window:



- Left bar shows colour Saturation level.
- Top bar shows Hue or colour.
- Right bar shows luminosity.
- Center square shows Hue and Saturation simultaneously

The **Color** split square shows the previously used colour on the left and the currently selected colour on the left. Colour data is shown to the left.

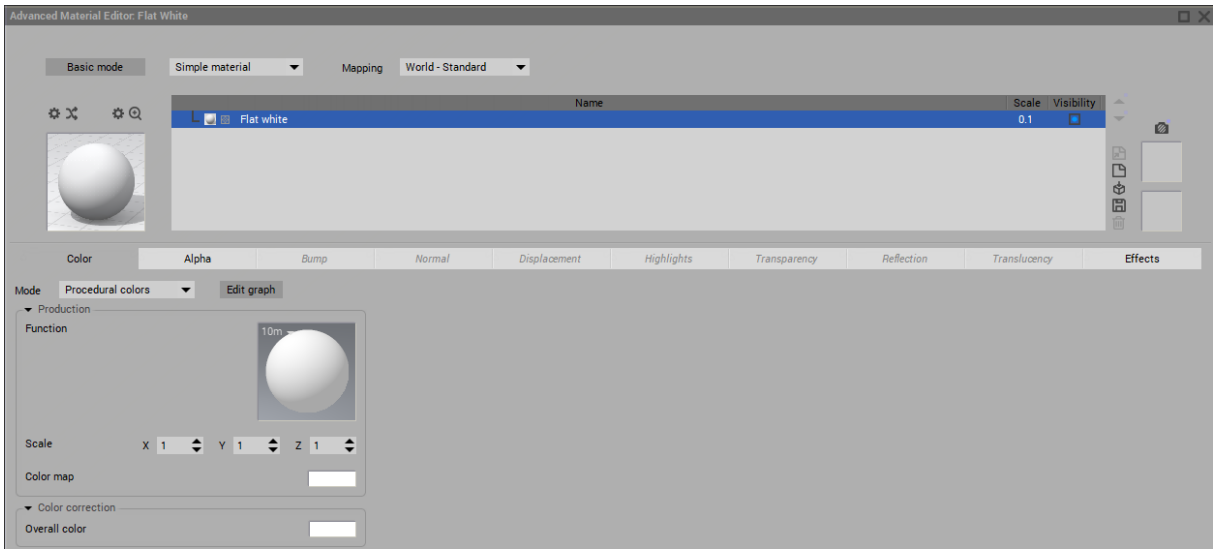


Once a particular colour has been selected, click on OK at the bottom to apply it to the planet.

Using Procedural Colours

Procedural colours offer a great variety of colour combinations and designs that can be applied to the planet.

- Highlight the **Planet** sphere in the **World Browser** and double-click the sphere in the **Object-Aspect** window to open the planet's **Advanced Material Editor.**



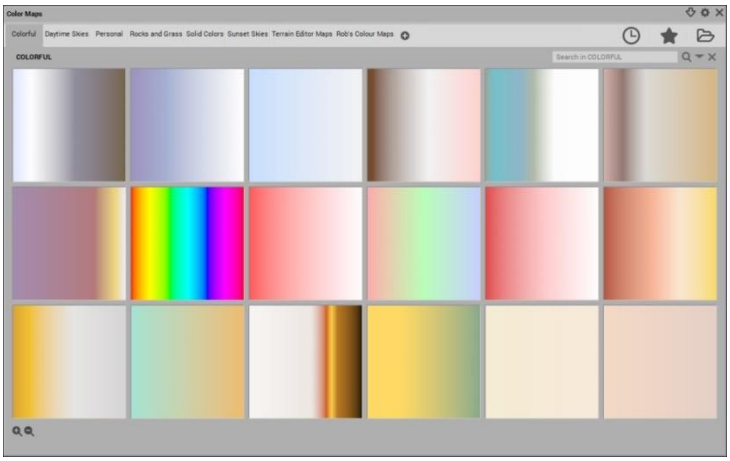
We will simply use the **Procedural colours** Mode for the planet but to lock the colour and design to follow the planet's position and rotation, set the **Mapping** at the top to **Object - Spherical** mode.
There is a world of possibilities for colouring the planet in Procedural mode. They are driven by three adjustable parameters:

1. The **Colour Map** selected or edited
2. The colour production **Function** selected or edited
3. The **Scale** used in the **Object - Aspect** panel.

The Color Map

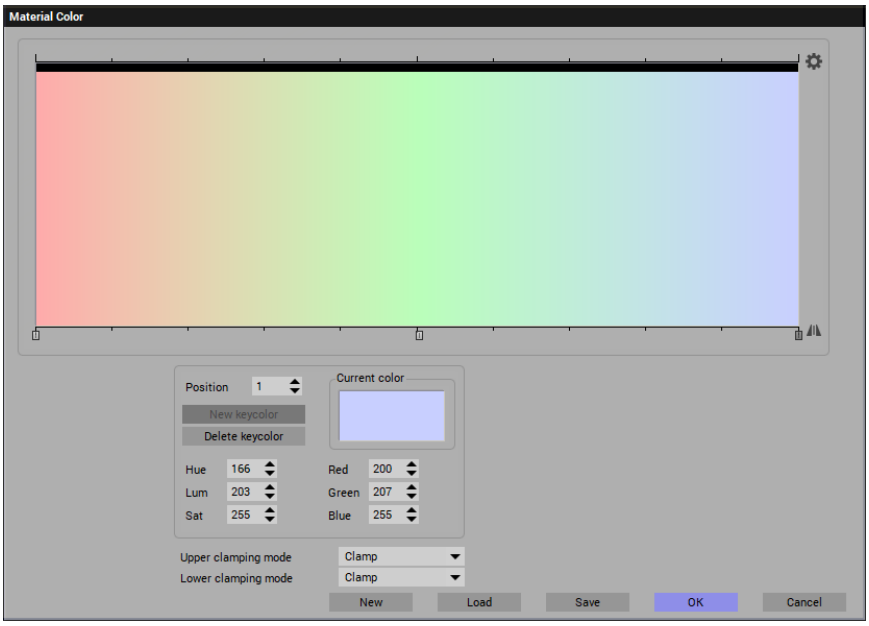
The current colours for the default Flat white material, as shown in the **Function** sphere and the **Color map** box, are just flat white. We'll add some colours……

- First, double-click on the **Color map** box to open the **Colour Maps** selection window showing many variations and many categories….

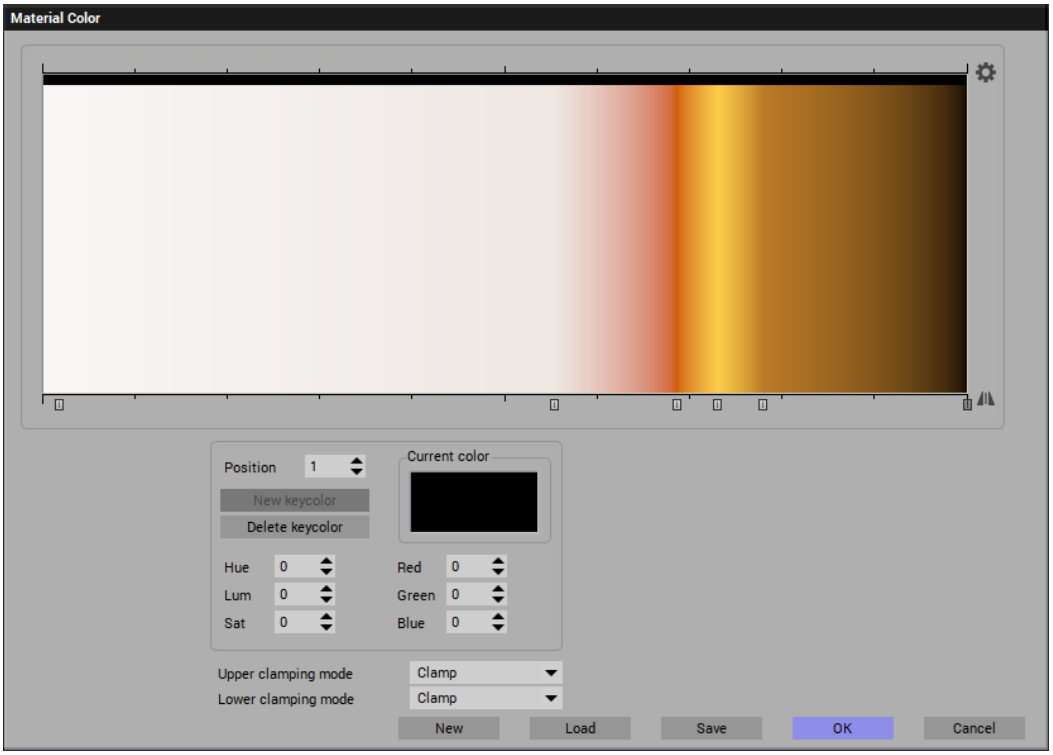


You are able to edit any of these colour maps by loading one that seems reasonably close to the desired colours ……

….and then right-click the colour box and select **Edit Color Map** to open the **Material Color Editor:**



- Double-click the **Color map** box and from the **Colorful** group of maps, select the **White Gold** map.
- Right-click the colour box and select **Edit Color Map** to open the **Material Color Editor** for the **White Gold** colour map.



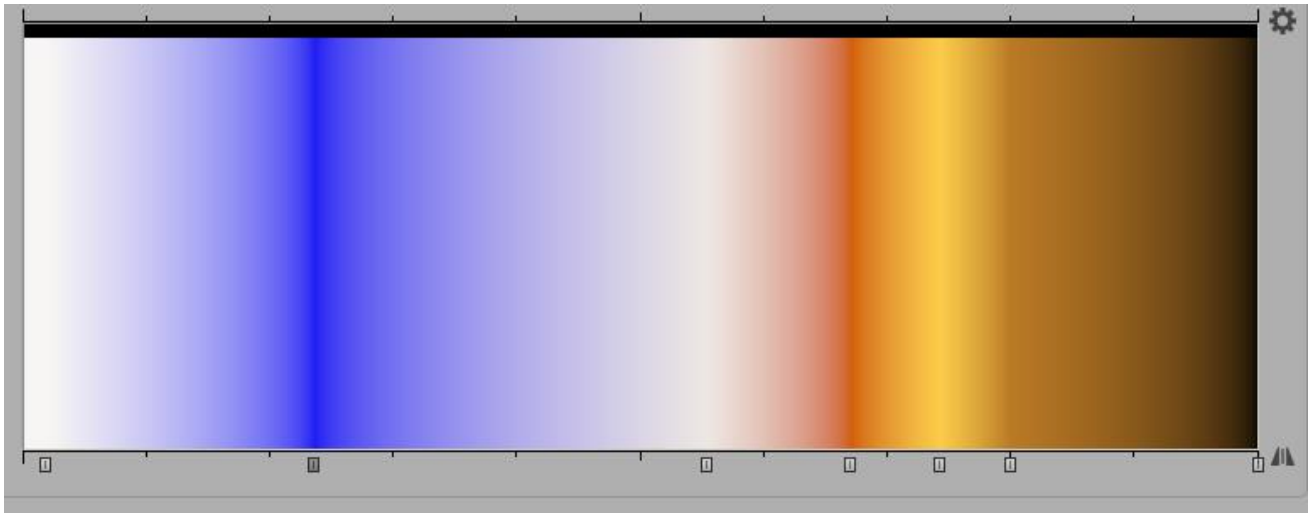
The **White Gold** colour map has six little squares or “keys” at the bottom. Each key denotes a particular colour, which changes gradiently to the colour of the adjacent key.

These keys can be moved to change the colour placement. Keys can be add or deleted and the colour of each key can be changed by selecting the key and clicking on the Current Color box.

- Place the cursor midway along the white space of the map window and click once.

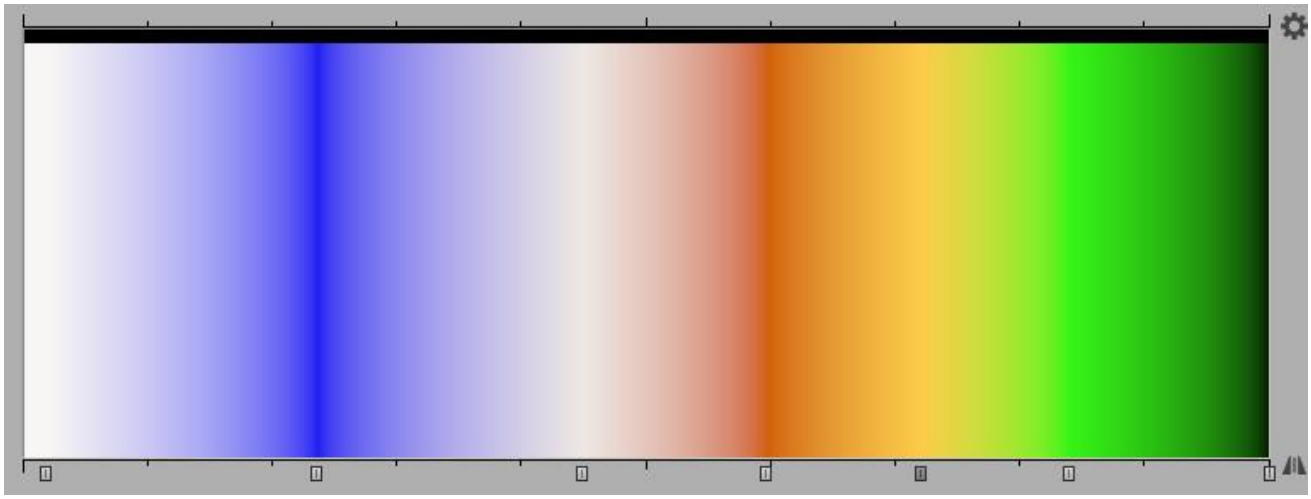
The **Current color** box shows white and the **New keycolor** button becomes active.

- Click the **Current color** box and select a bright blue from the **Color Selection** window, Then click OK.



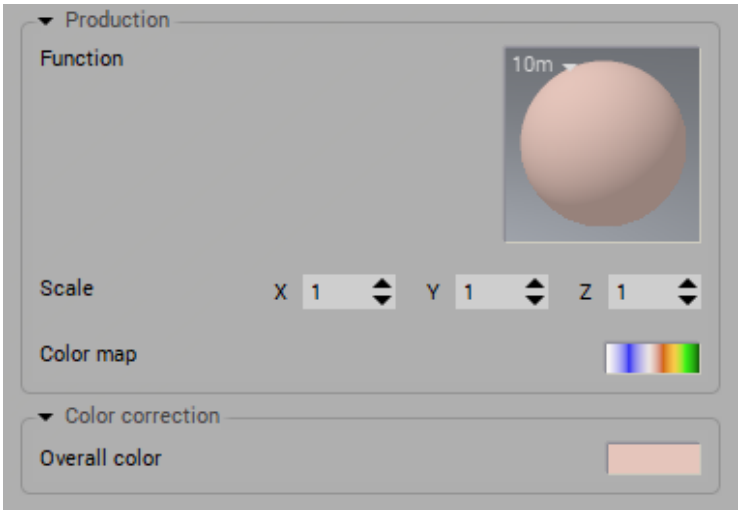
- One at a time, click on each of the keys on the bottom-right side and move them to the left a bit.
- Click on the second from the right key and, using the **Current color** box, change its colour to bright green.

If you wish, you can save this modified colour map under any name.



The preview of the planet in the **Advanced Material Editor** shows the **Color map** as we have adjusted it but the sphere and **Overall color** seem to be solid light brown.

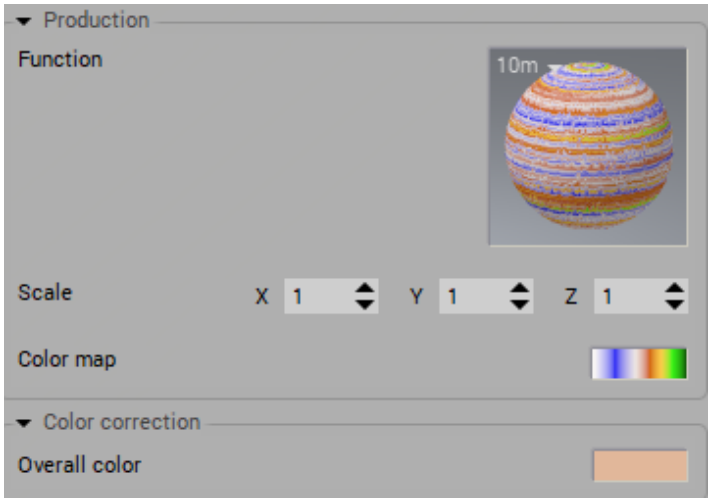
Next we'll apply the multi colours of the Color map onto the planet using some form of Function.



Changing the colour Production Function

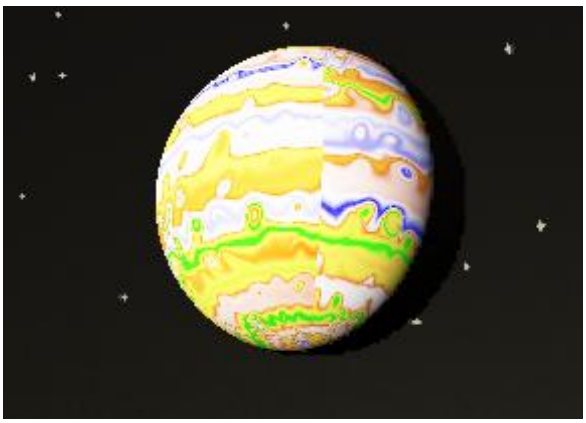
- Double-click the sphere in the **Function** panel to open the window of functions. There are many categories, each with various gray-scale representations of how they will influence the colour map.
- Find the **Layers** category and select the **Pebble Bumps** function:

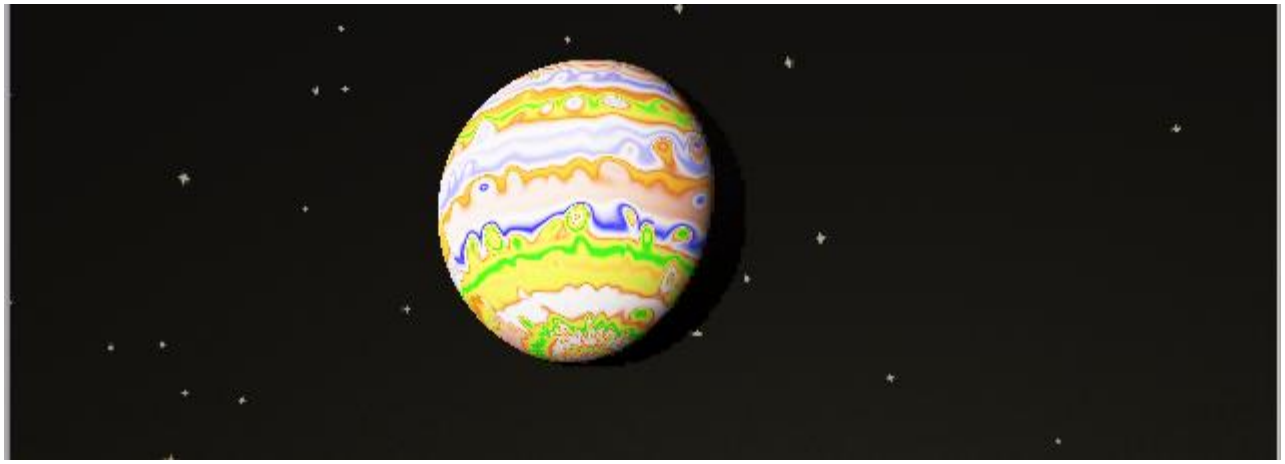
Right now the colours seemed to stripe the sphere with multiple layers of the colours, not just one span of the colour map we created.
This is due to the **Scale** (default = .1) of the sphere in the **Object - Aspect** panel.



- Change the **Scale** in the **Object - Aspect** panel to 3.

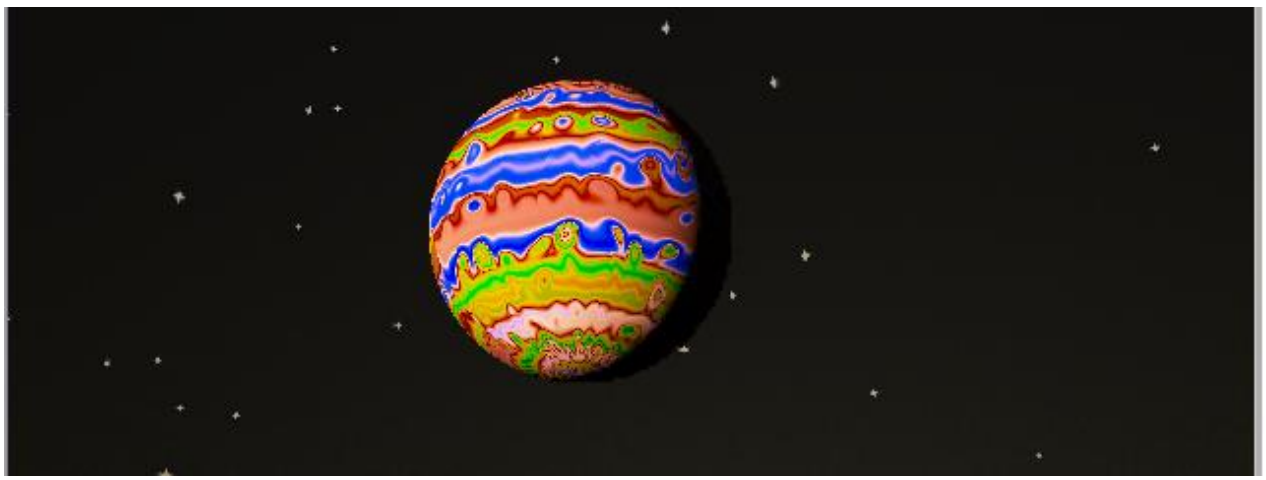
You may see a seam in the applied colour (as seen here). If so, use the rotation grips in the top-view panel to rotate the planet some until the seam is no longer visible



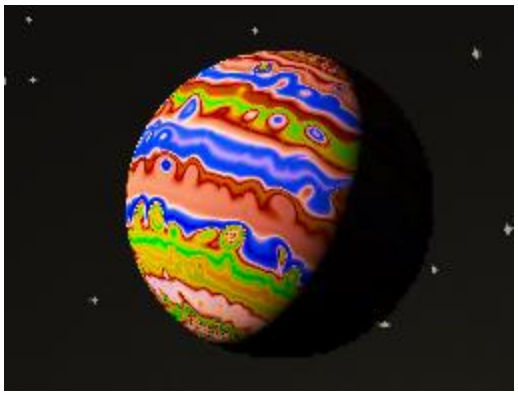


This planet has a good distribution of the color map we created but is a bit pale. Below the colour **Production** panel is a **Color correction** box that currently shows the **Overall color** of the planet as light brown.

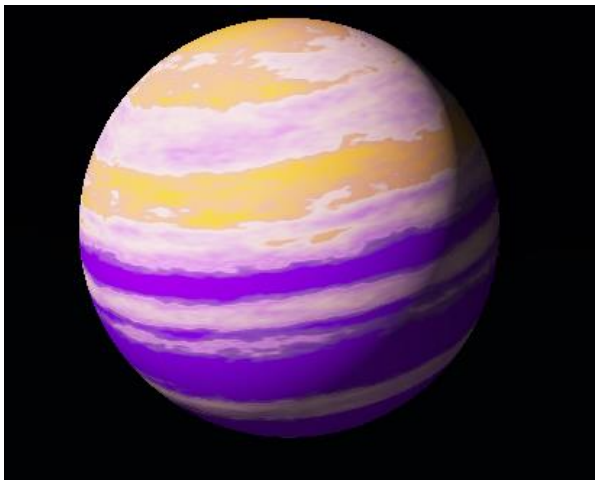
- Click on the **Overall color** box and change the colour to a deeper brown.



Using the planet's rotation grips in any of the three (top, front & side) views of the scene, the planet orientation and colour pattern can changed. Changing the **Point light** relative to the planet will adjust the light direction and planet phase.

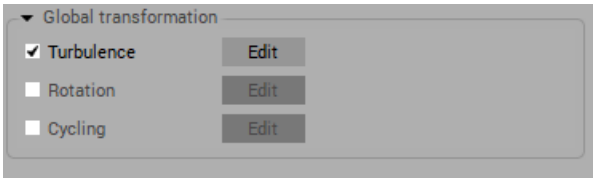


Adding Material Turbulence

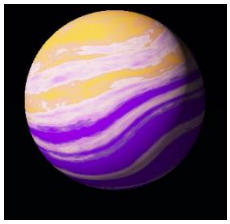


The **Material Turbulence** effect can manipulate the simple procedural colours of a planet surface considerably further after applying a **Color map** and a colour **Production function**.

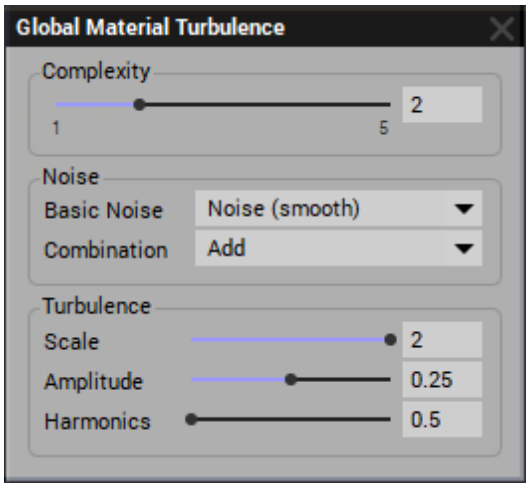
We will begin with a simple flat-white sphere with a simple color map and the Banded Layers function applied.



- In the spheres **Material Editor**, click the right-most; **Effects** tab.
- Near the bottom of the page, in the **Global transformation** section, activate the **Turbulence** check box.

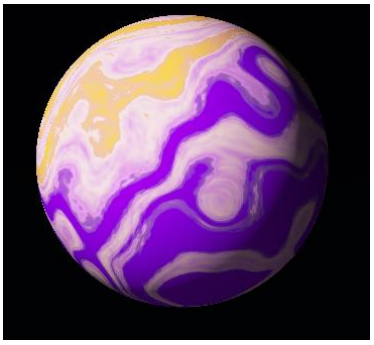


Immediately, the relatively straight banded lines of the planet colour will be altered:



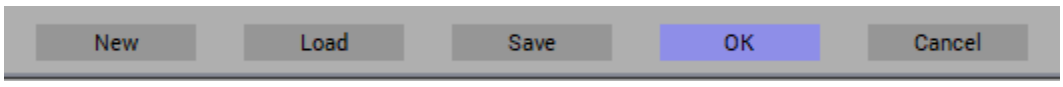
- Click the **Edit** box to the right of the Turbulence title to open the **Global Material Turbulence** window.

Here, you can select from a list of turbulence **Basic Noise** types, in various **Combinations** and also apply a number of different parameter values to that noise.



The result is a myriad of material colour patterns that can be applied to the planet.

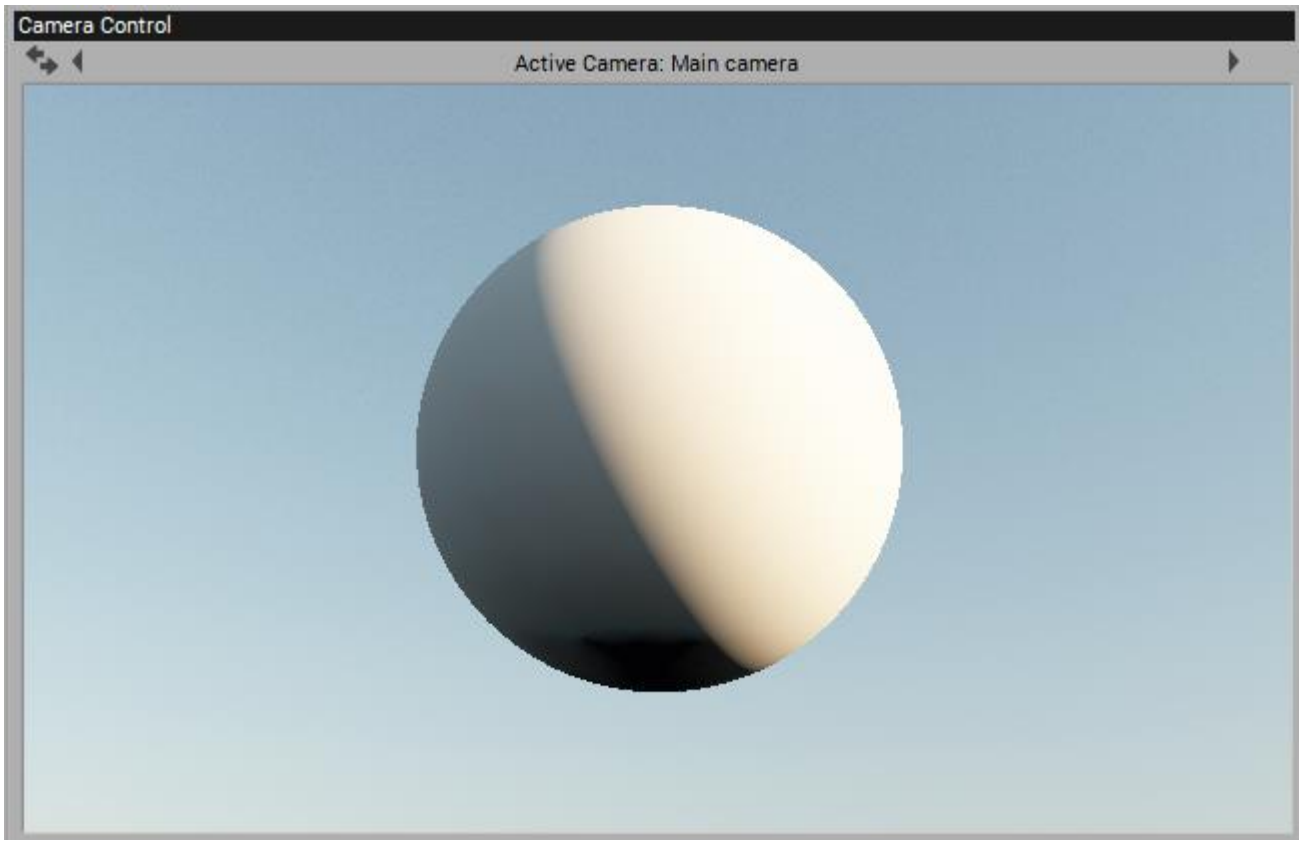
Remember, if you are satisfied with a particular material type and colour arrangement, you can save it as a material for later use:



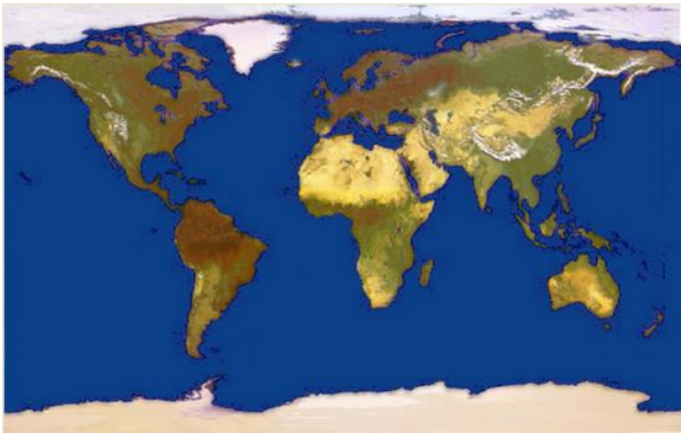
Bit Mapping the Sphere Surface

Another way of applying colour or a specific picture onto a planet is to use Projected Bit Maps.

- We will begin, as before, with a default, empty scene.
- Insert a default sized sphere and raise it up into the sky a bit.
- Tilt the camera up toward the sphere and center it in the view
- Change the sphere material to **Flat white**.
- Remove the **Ground** plane.



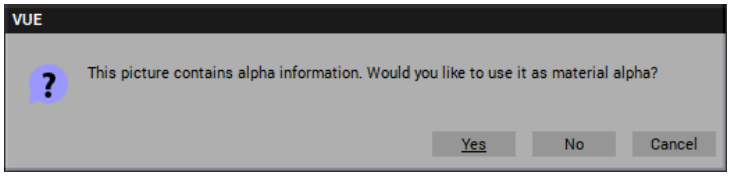
In the **Object - Aspect** panel, double-click the sphere or right-click it and select **Edit Material** from the list.

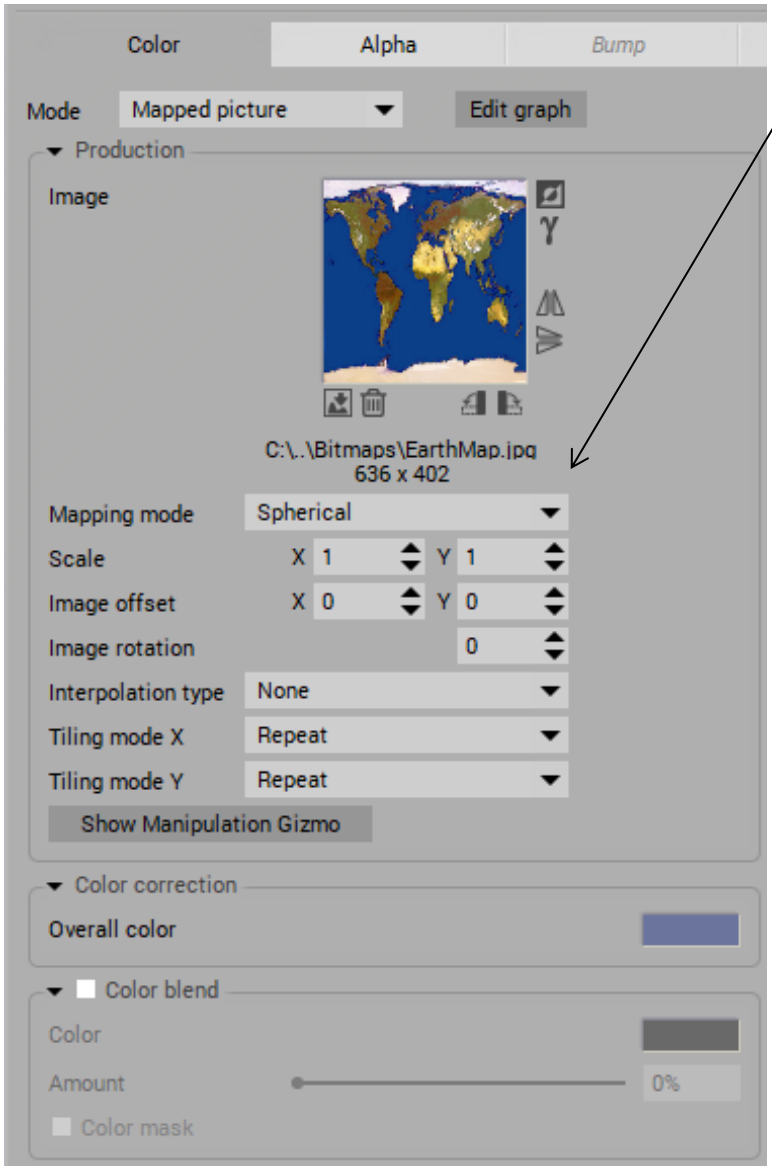


Under **Color** tab, set **Mode** from **Procedural Colors** (default) to **Mapped picture**.

In the **Bitmaps** window that is displayed, locate and load the **Earthmap** picture:

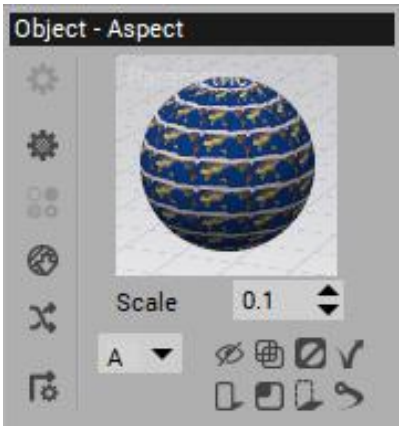
(If a selected picture has alpha (transparency) information in it, a request is displayed if you want to use the Alpha info for the material Alpha. Click **Yes)**





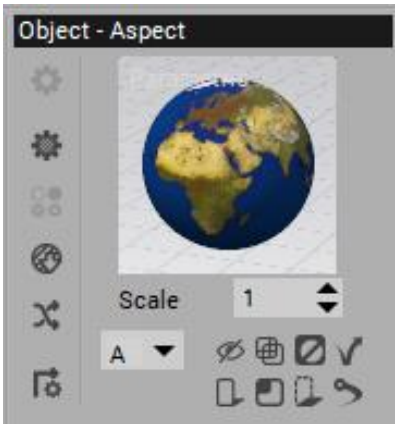
Set **Mapping mode** to **Automatic** or **Spherical** (both work for spheres)

Though the picture of the world in the **Advanced Material Editor** looks correct, but the resulting preview image on the planet looks way off. This a result of the Scale used in the **Object - Aspect** panel. It's currently at a value of **.1**



➢ Change the **Scale** value in the **Object - Aspect** panel to 1.

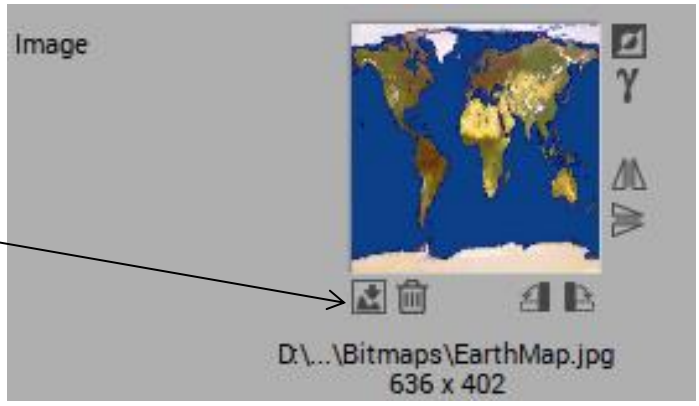
The image on the sphere should now align properly.

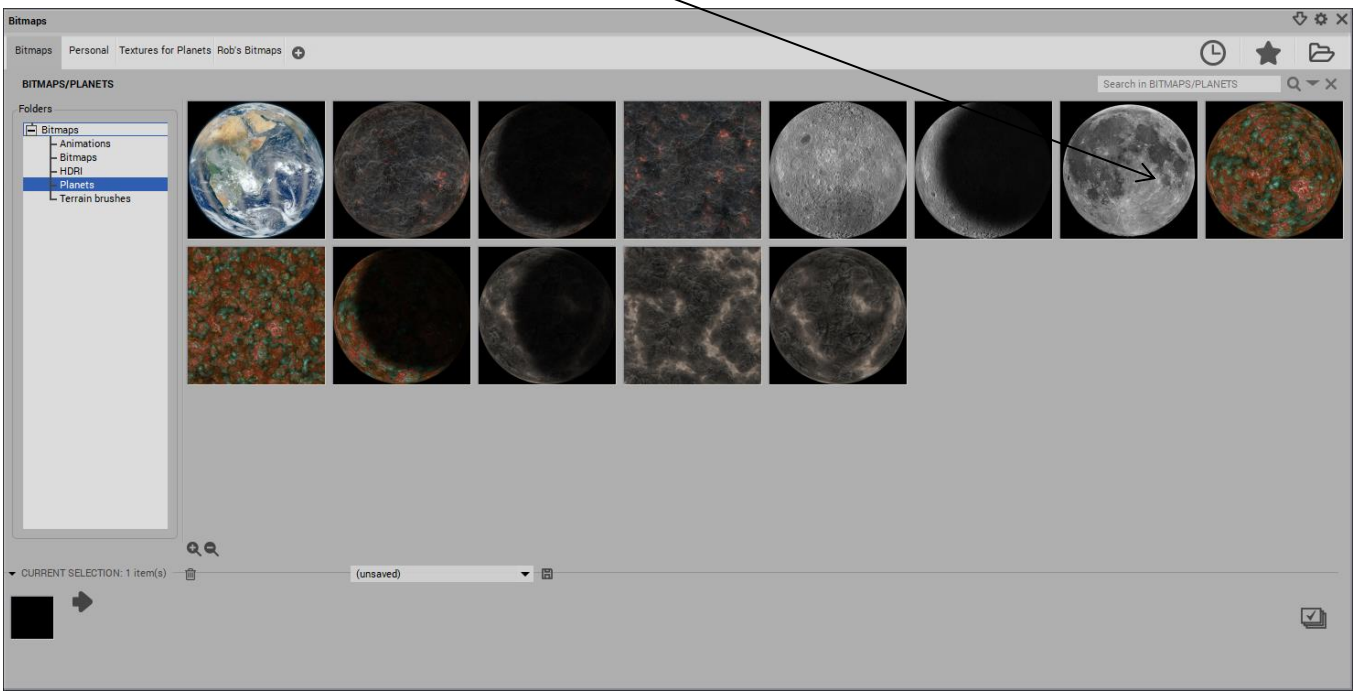


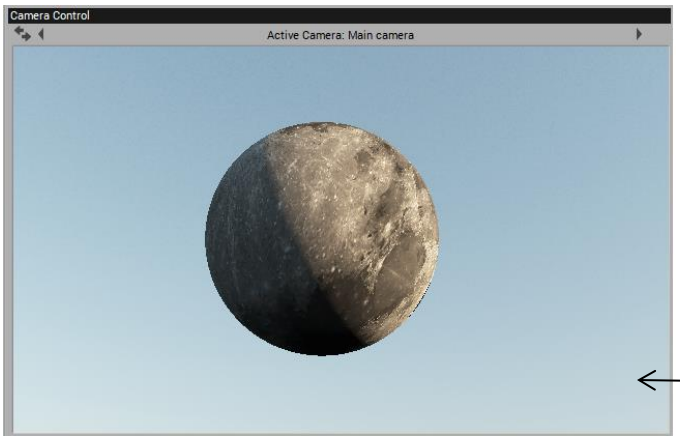
Circular Bitmaps

In the first section on the **Custom Planet**:  object, we found that you can apply either a rectangular or a circular bitmap picture to it. The resulting planet will look fine.
However, If you try to apply a circular bitmap onto the sphere, the resulting image on the sphere will have gaps in it.

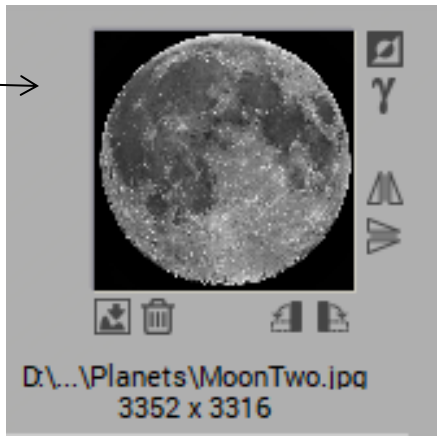
- Double-click the planet in the **Object - Aspect** window to open the **Advanced Material Editor.**
- Click on the **Load** Image icon at the bottom-left to select a different bitmap.
- From the **Planets** group, select the **Moon** circular bitmap.



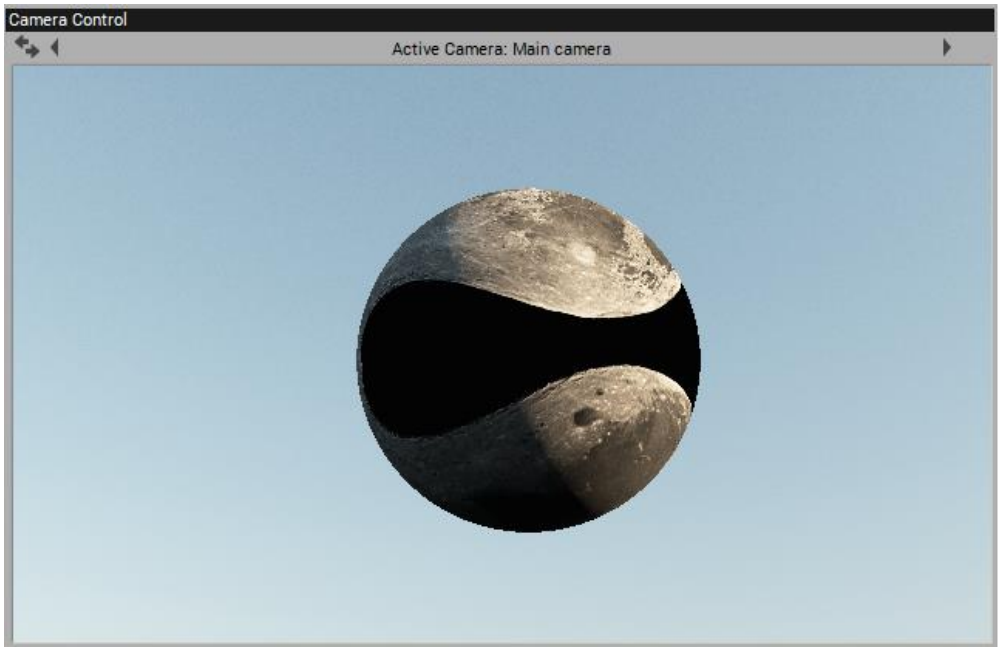




The Image in the **Production** preview looks good
The camera preview looks reasonable, if aligned wrong.

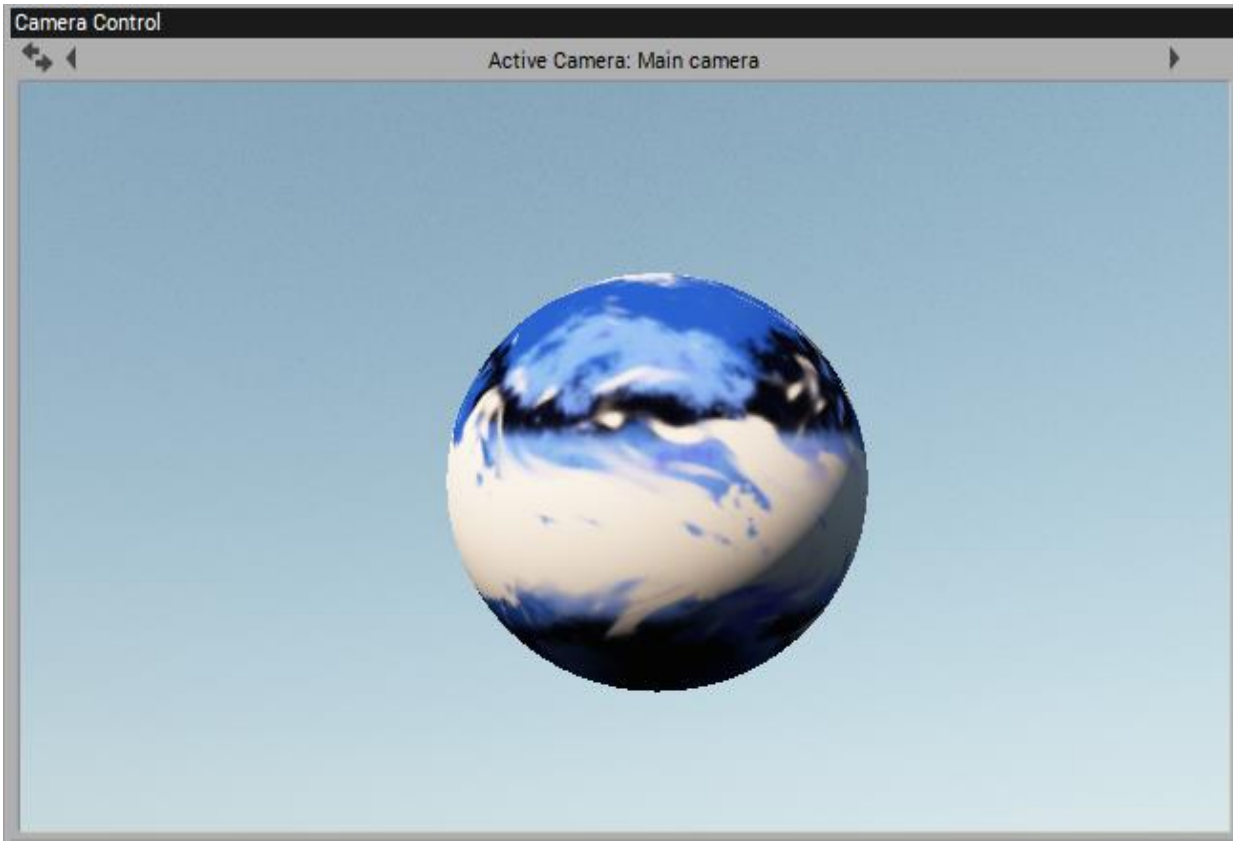


If we use the rotational grips of the three scene views (top, front & side) to realign the planet image, we will find that there is a large black gap in the planet surface that the image failed to cover.

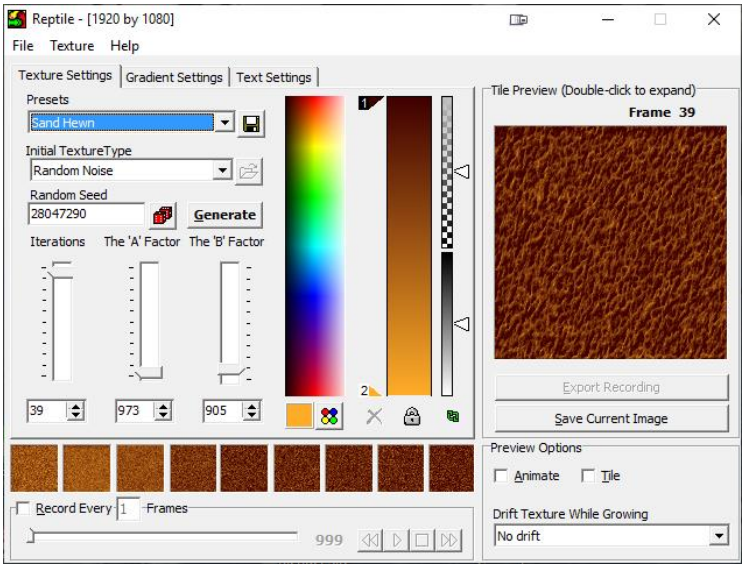


Textures for Planets Software

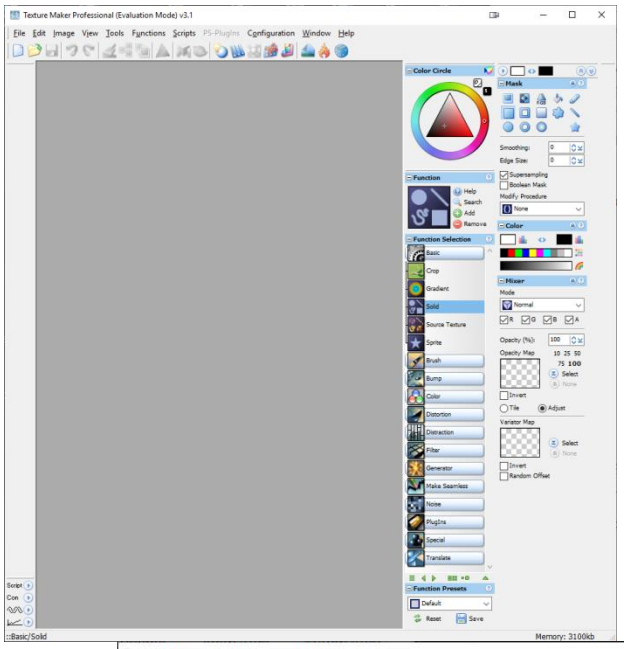
A free software program called **Textures for Planets** is available for anyone to download, customize and create unique rectangular texture bitmaps in PNG format. A separate **etherealcanvas** tutorial has been created to walk the reader through its use and customization of textures.



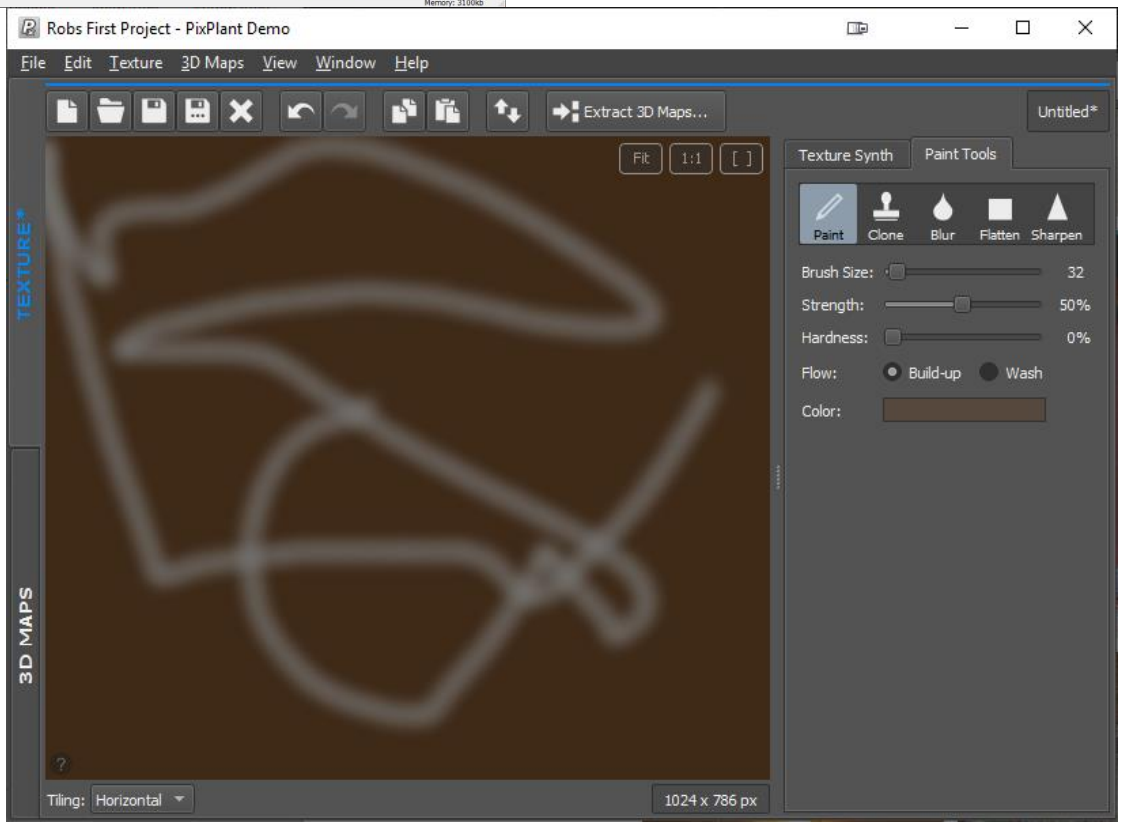
Or use Reptile Texture generator



Or Texture Maker



Or PixPlant generator with alpha



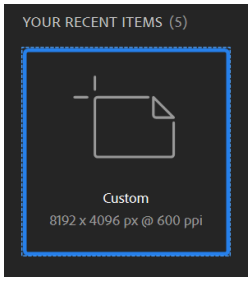
Or use stock pictures and textures at StockFreeimages.com

Using Photoshop or Paintshop for Planet Textures

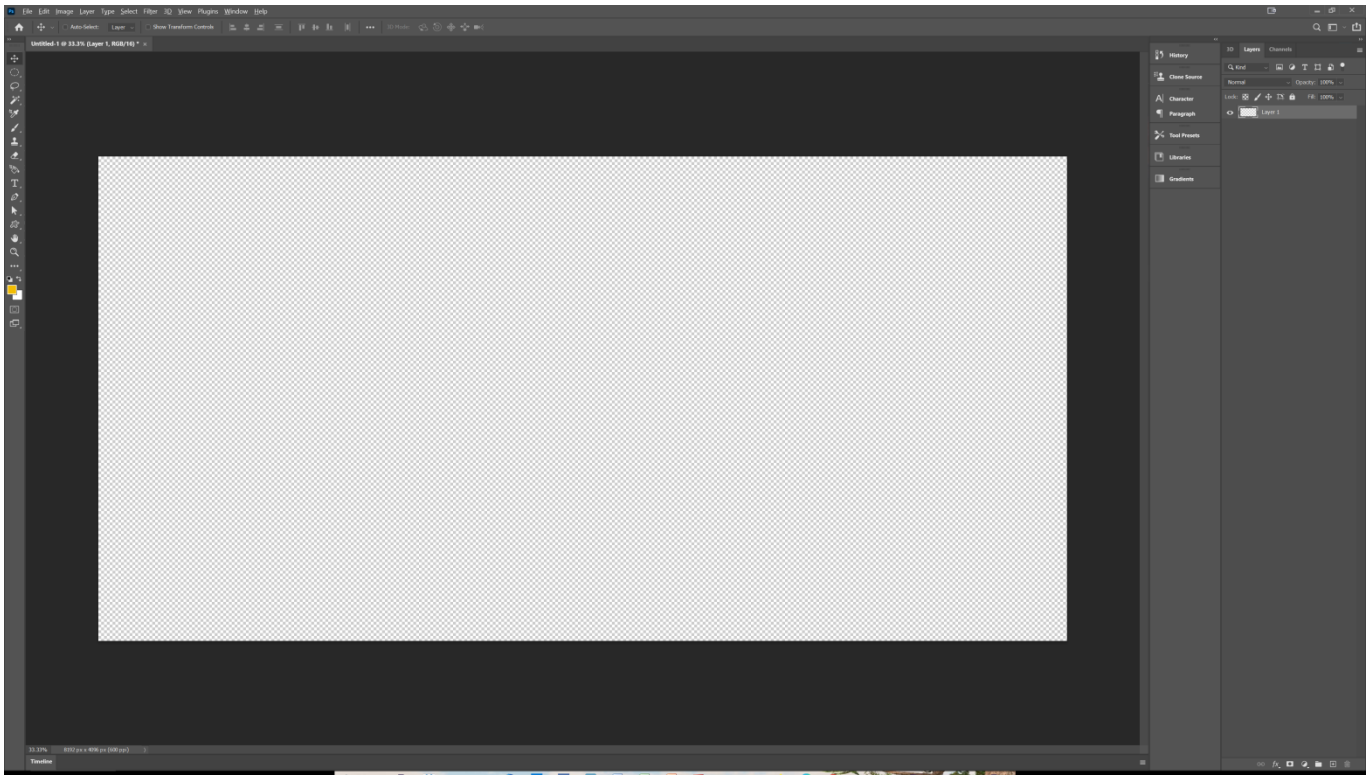
Creating Planet Textures in Photoshop

We are looking to create a 8k by 4k image that will be bit saved as a planet texture which then can be mapped onto a sphere in Vue. We are using Photoshop 2021 for this tutorial.

We begin with a 2048 x 1024 image size at a resolution of 600 pixels in Photoshop (this may be overkill but the best for detail. If one has been created earlier, it should be shown in the Recent Items pane.



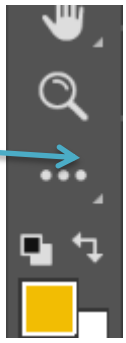
Initial Image area



We will be using the gradient tool of Photoshop to create the initial design on the texture map. Then we will alter the basic design using a number of Photoshop's distortion tools to make the basic design more interesting.

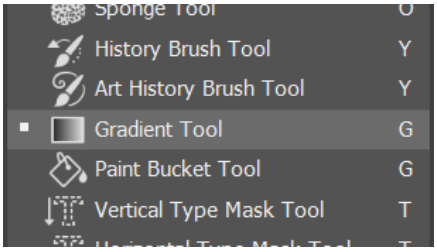
The Gradient Tool

The Gradient tool icon is not immediately apparent in the default toolbar of icons to the left of the image area.



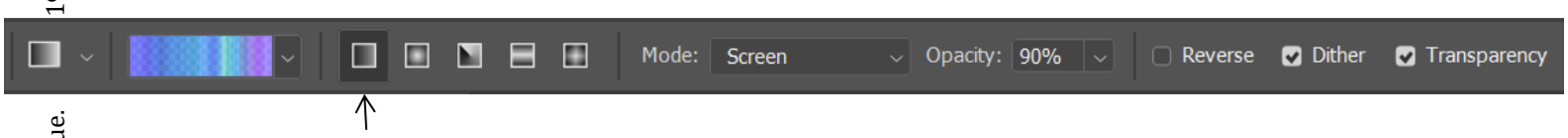
- Right-click on the down-arrow to the right of the three dots below the magnifying glass to open a secondary toolbar of icons.

- In the list of tool icons in this window, click on the **Gradient Tool**, near the bottom.



As a result, the Gradient tool replaces the three dots on the left toolbar.

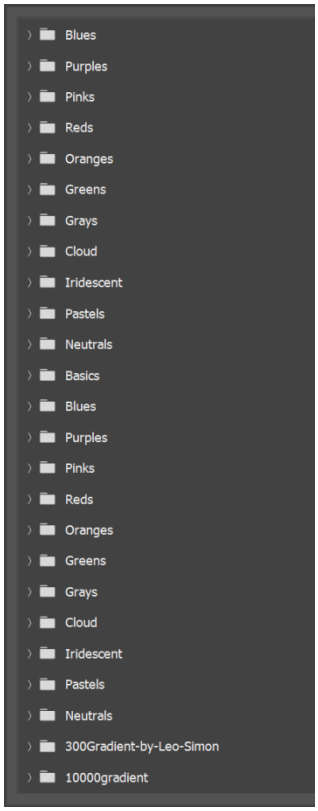
A number of controls for the gradient tool are also shown in the top toolbar:



There are five orientations of the gradient that can be displayed; linear, circular, angled, reflected and diamond.

- Select the first, **Linear** orientation type (arrow)
- Set the **Opacity** to 100%

The currently active gradient is displayed in the box to the left of the orientation boxes.

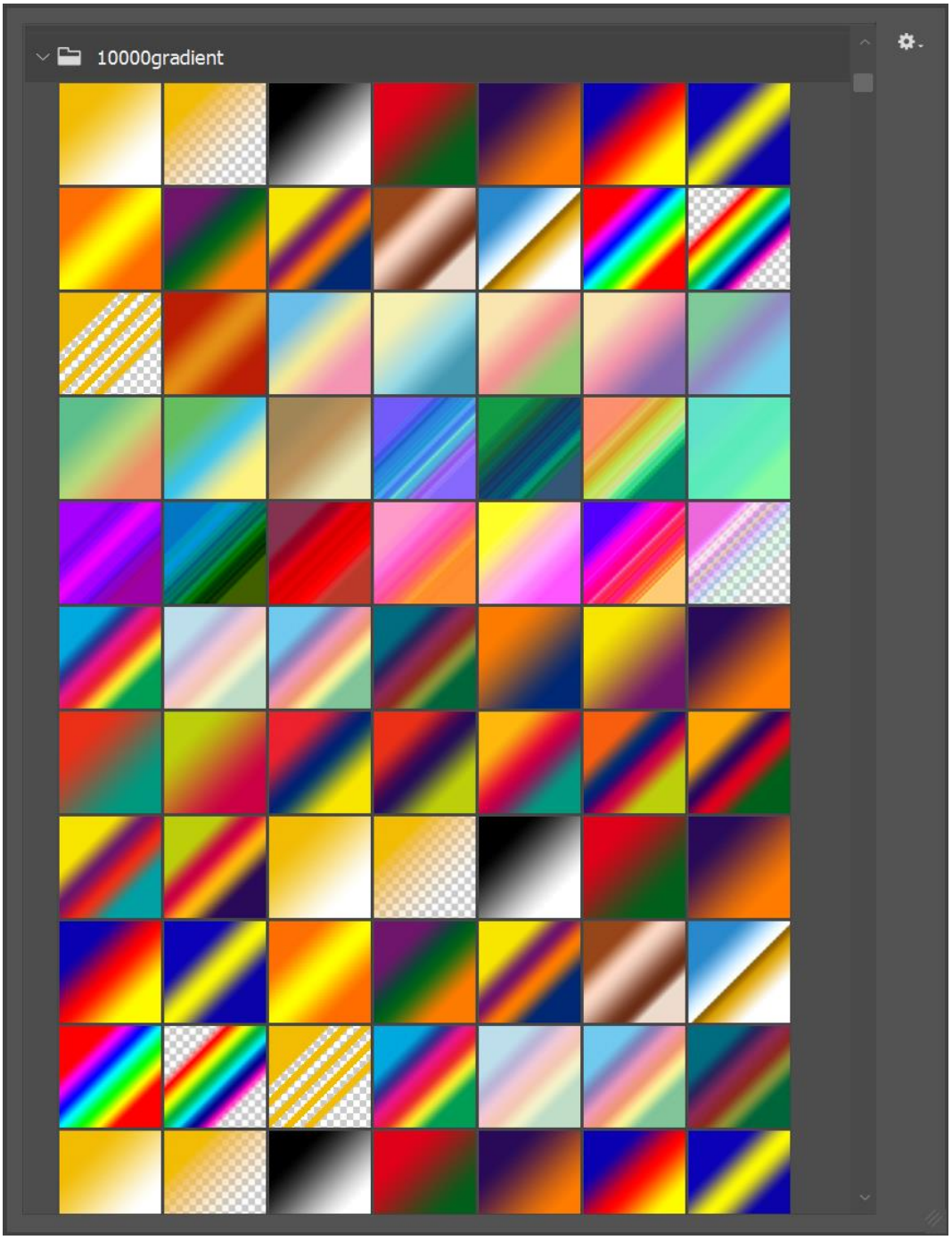


- Click on the down-arrow to the right of the gradient display to display the list of folders, each containing various types of gradients.

Gradients, like the two bottom ones, are freely available on the web at https://www.deviantart.com/infinitystyle/art/10-000-Gradients-137714491 and https://dribbble.com/shots/5609048-300-Gradient-Pack-Free-Download

- At the bottom of the list, click the right-pointing arrow beside the **10000gradients** listing**.**

It will change to a down-arrow and display the 10000 gradients below… (**NOTE** the checkered areas in some gradients are transparent areas)



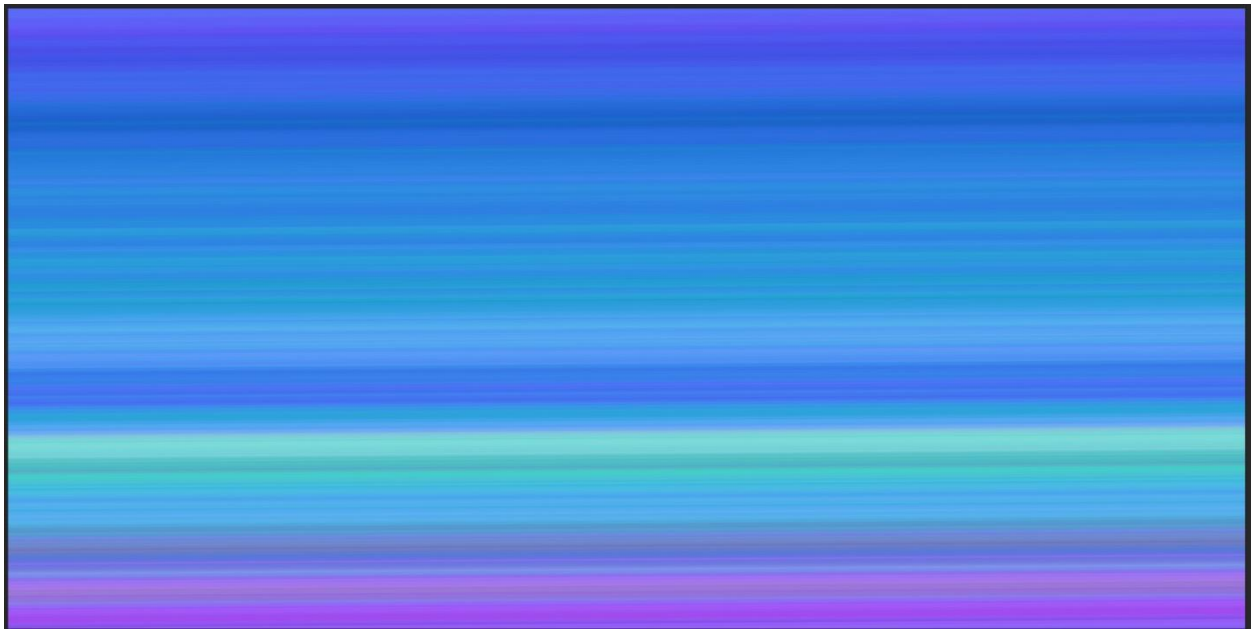
- Use the scroll bar at the right to look through all 10,000 gradients

- To select a gradient pattern, simply double-click on it and it will become the current active gradient.

The cursor also changes to a cross icon to show that we are in draw mode.

- To apply the gradient to the image space, simply click above the space and then drag the mouse directly below the space and release the mouse button.

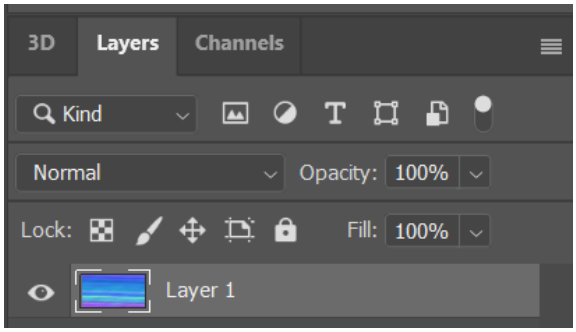
NOTE: the placement of the drawn line determines the orientation of the applied gradient. Drawing it across the space left to right will orient the gradient up and down. Drawing it at an angle will result in an angled gradient fill. Drawing from below to above the space will create the gradient 180^{O} rotated on the space. Hold shift while drawing the vertical line to make it perfectly straight down.



Adding Distortion Effects

There are many ways to make the basic gradient more interesting than just straight line colours. We will add some of these now.

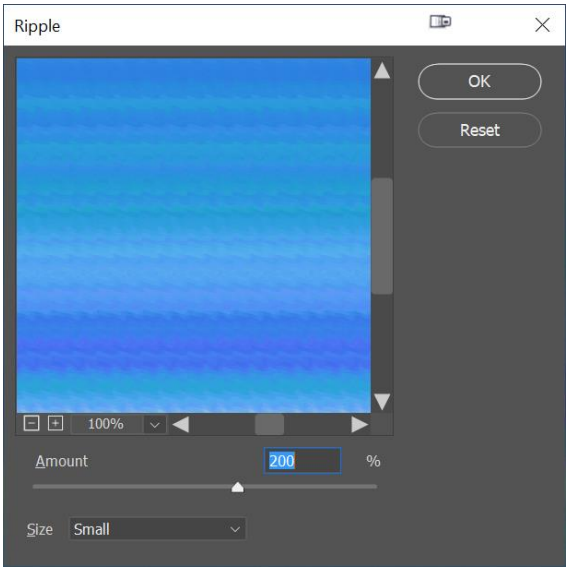
Make sure that the gradient is on an active layer and shows the eye icon and highlight around the image. Most often this will be our only layer and would be named Layer 1.



Filter - Distort – Ripple

The first adjustment we take is to place ripples in the colour streaks using a ripple effect.

- Select Filter from the top-most menu, then Distort and then, Ripple.

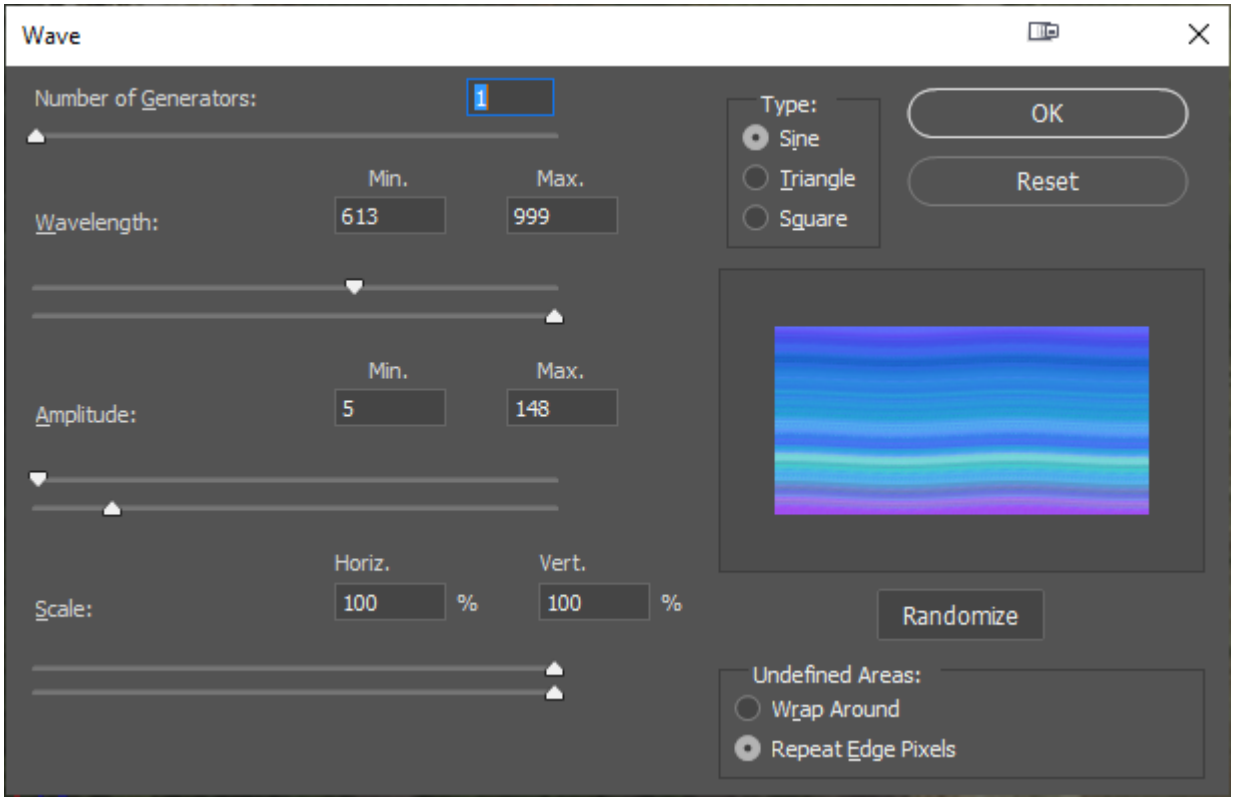


A window of the image will be displayed. This will show a preview of the effect that various Amount and Size values of the Ripple function are having on the image.
This effect will be greater on lower resolution images. At 2K x 1K, a reasonable ripple is found at an **Amount** of around 200 and a **Size** of Small.
We can always play with these values till we have a pleasing result. Doesn't have much of an effect at 8K x 4K image.

- Click **OK** to apply the effect and close.

Filter – Distort – Wave
The second effect will create waves in the colours of the image

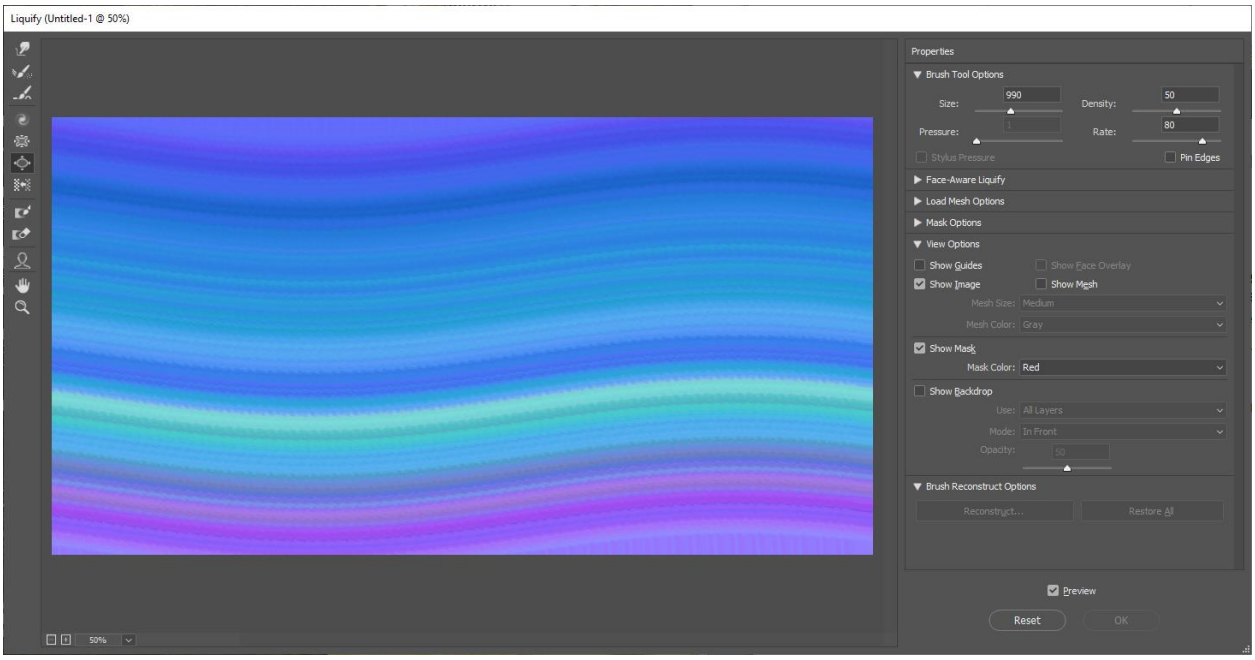
- Select Filter from the top-most menu, then Distort and then, Wave.



- Set the **Type:** to **Sine** and set **Repeat Edge Pixels** on**.**
- For the wave generator, set the **Number of Generators** to 1
- For the **Wavelength**, set the Max to 999. Then scroll the Min slider back and forth to see the resulting wave in the preview. A value from 400 to 700 are reasonable.
- For the **Amplitude**, set the Min to 1. Then, again, scroll the Max slider and view the preview wave amplitude. A value from 60 to 100 seems reasonable.
- The **Scale** will always be 100% for both Vertical and Horizontal.
- You can play with the Randomize button to see varying results each time it is pressed.
- When the wave seems good, click on OK. The image will take on that wave.

Filter – Liquify – Forward Warp

This tool will allow us to place some distortions in specified areas of the image to randomise the look of the planet surface.



The various tools in Liquify are on the left tool bar icons. We will try a few of these.

Liquify once had a **turbulence** tool for making smudges to the image. Now, instead we will use the **Forward Warp** tool to create this effect.

- Click the **Forward Warp** tool:  to highlight it.

- Set the Brush Size to 50 – 300, Pressure at 100% and Density to 100%
- Now move the cursor into the image and touch the left mouse button down briefly while moving it over the lines of the image to distort/smudge them some.
- Continue smudging at different brush radius values until a good amount of distortion is applied to the image.
- Click OK and then save the image as a Photoshop file. (not a JPEG yet)

Filter – Liquify – Twirl

Another effect we can apply to the image is the Twirl effect which distorts the pixels under the brush in a twisting motion. This can create storm areas in the planet surface. This should be used only 1 or 2 times on a planet.

- Click the **Twirl Clockwise** tool:  to highlight it.
- Set the Brush Size to 200– 300, Pressure at 100%, Density to 100% and the Rate to 70 to 80.
- Select an area with good contrast and place and hold the cursor there while holding the left mouse button down.
- Continue holding the left mouse button down until enough twisting has happened to reveal a good storm circle on the planet surface.
- Click OK to apply the Twirl distortion to the main image.

Filter – Liquify – Pucker

The Pucker tool distorts the pixels of the image by drawing them closer together. Use this carefully near the image edges as the background of the image may become exposed

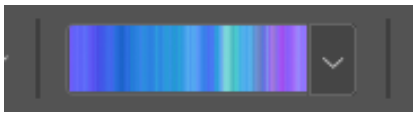
- Click the **Pucker** tool:  to highlight it.
- Set the Brush Size to 100– 200, Density to 100% and the Rate to 70 to 80.
- Now move the cursor into the image and hold the left mouse button down for a period on the image to distort/pucker them some.
- Click OK to apply the Pucker distortion to the main image.

Filter – Liqyify - Bloat

- Click the **Bloat** tool:  to highlight it.
- Follow the same process as the Pucker tool to expand various pixel areas of the image, then click OK. And save the Photoshop file.

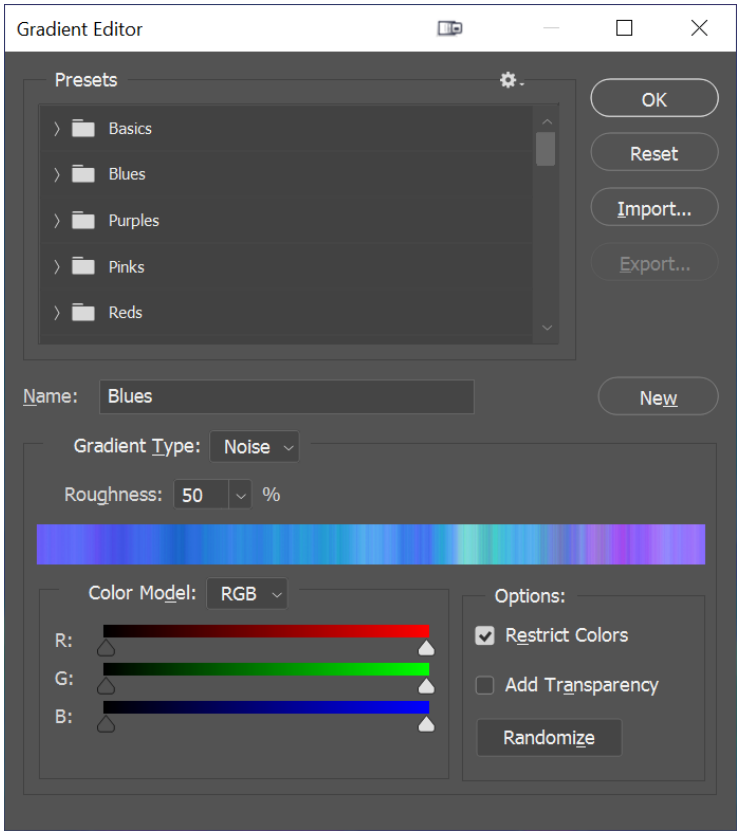
Create Random Gradients

A simple way to create infinite gradient designs is to use the randomise tool in the **Gradient Editor**.
We access the **Gradient Editor** by double-clicking on the small gradient preview at the top of the Photoshop screen.



Initially, the current gradient is displayed in the gradient preview.

- Simply click the Randomize button to generate a new gradient.



Using the Painter – Particleshop Plugin

In both the Photoshop and the Paintshop application, below, the Particalshop plugin (if installed) can be applied to add a host of effects to the existing texture.

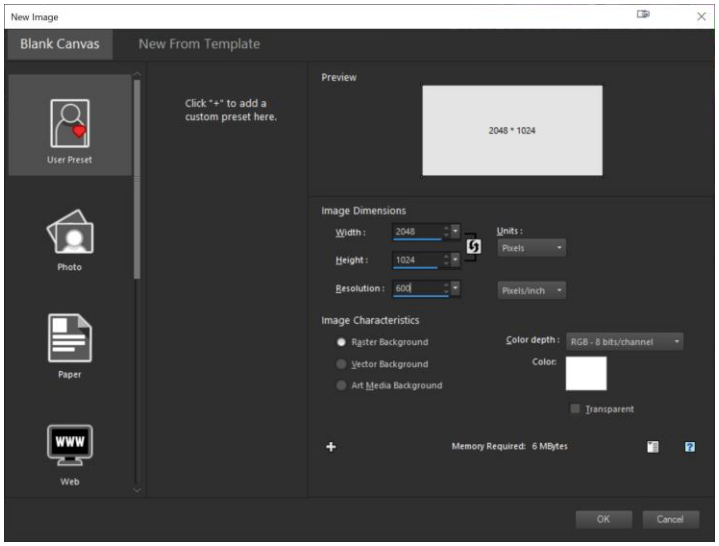
- In Photoshop, launch the Particleshop plugin by selecting; **Filter/Painter/ParticleShop.**
- In Paintshop, launch Particlshop by selecting: **Effects/Plugins/Painter/ParticleShop.**

Creating a texture in Paintshop Pro

We are looking to create a 2k to 4k image that will be bit saved as a planet texture which then can be mapped onto a sphere in Vue. We are using PaintShop Pro 2021 for this tutorial.

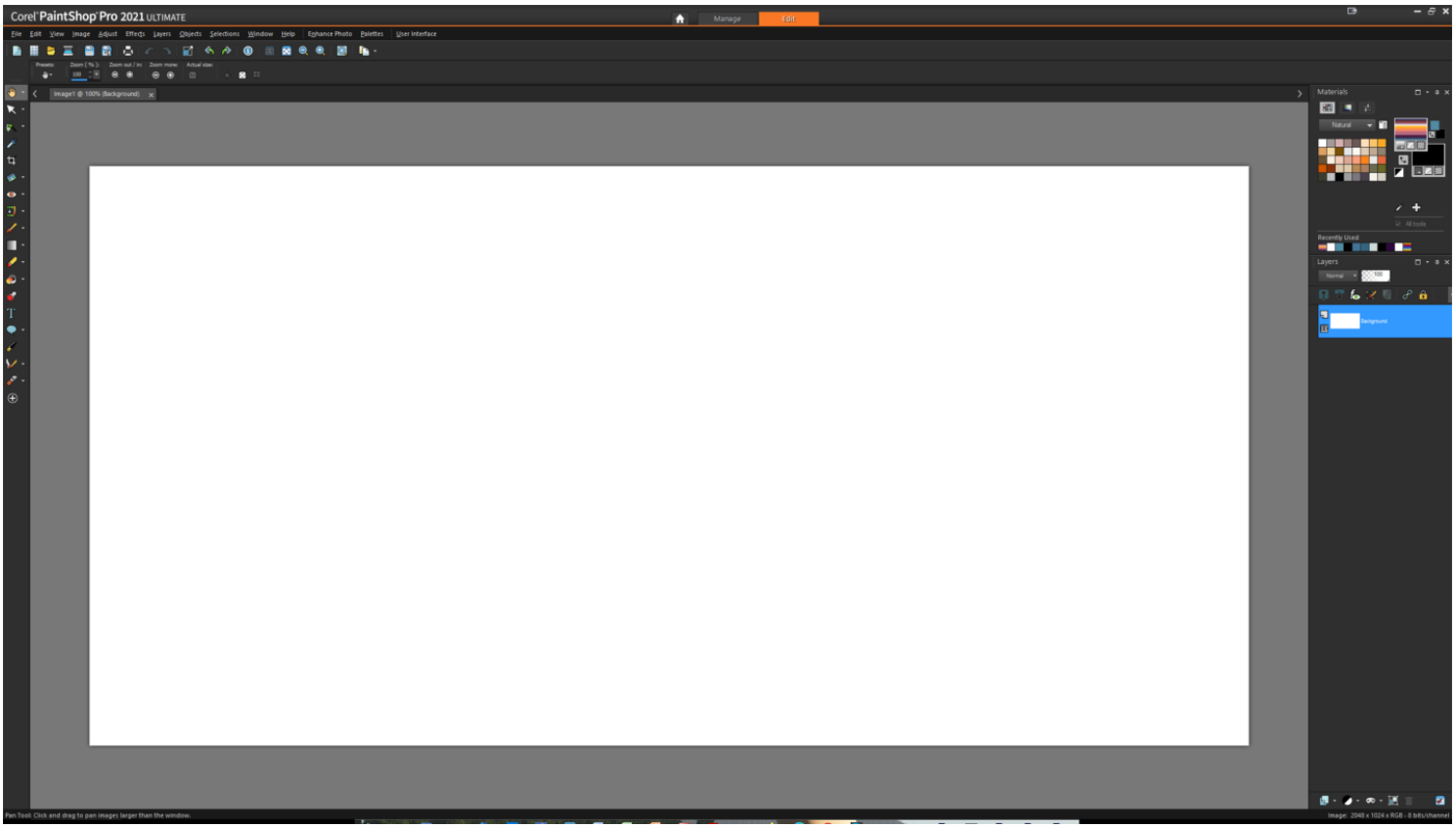
We begin with a 2048 x 1024 image size at a resolution of 600 pixels in Photoshop (this may be overkill but the best for detail. If one has been created earlier, it should be shown in the Recent Items pane.

- Otherwise, Click **File/New**



A New Image window will be displayed.

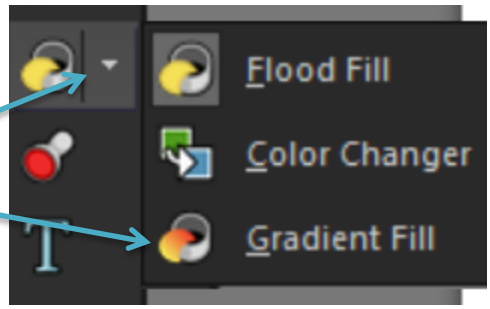
- Set the **Dimensions** to 2048 Width by 1024 pixels **Height**, and a **Resolution** of 600 pixels/inch.
- The Image **Characteristics** will be Raster Background and colour depth of 8 bits/channel.
- Click OK, the page will be created:



We will be using the gradient tool of Paintshop to create the initial design on the texture map. Then we will alter the basic design using a number of Paintshop's distortion tools to make the basic design more interesting.

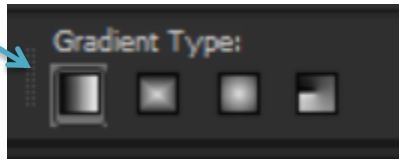
The Gradient Tool

The Gradient tool icon may not be immediately apparent in the default toolbar of icons to the left of the image area.

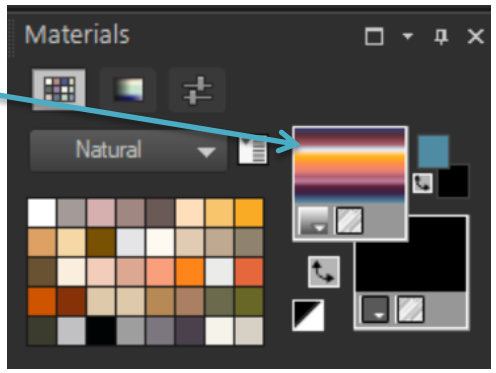


- Right-click on the down-arrow to the right of the **Fill** tool to open a secondary group of icons.
- Then select the **Gradient Fill** tool.

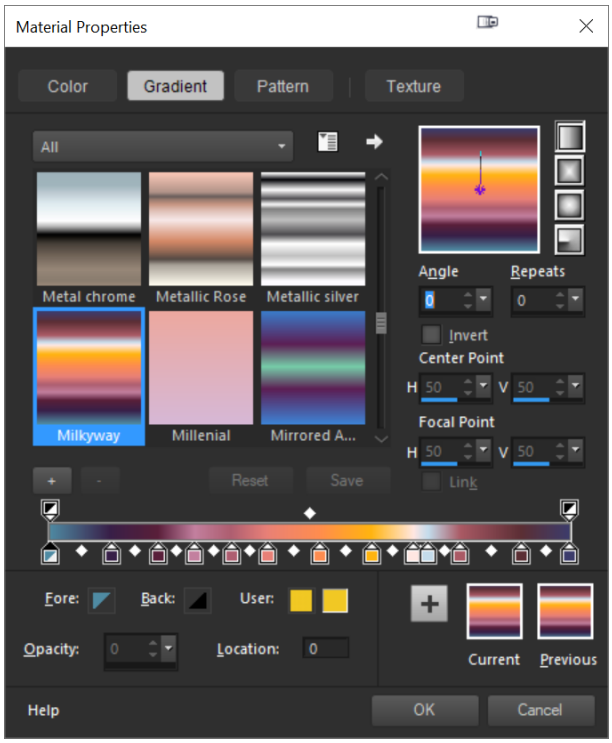
- Above the display area select the Linear Gradient type



- In the **Materials** view to the upper-right, select the **Foreground and Stroke** square which should be showing some kind of gradient pattern.



A **Material Properties** window will open in the display area:



Scrolling though the patterns on the left of the window reveals the various predefined gradient patterns available with PaintShop. The gradient presets available is not as extensive as PhotoShop but the existing gradients are customizable and can then be saved.

The colour dots below the gradient sample line are to change/select a different colour at that point in the gradient.
The black and white dots above the line change the opacity at that point along the gradient.

Example:

- Select the Anodized Rainbow gradient.
- Near the center of the gradient line, select a colour dot and, using the right; User colour square below the line, (eye dropper) change it to black.
- Click the Add to Palette plus sign: +

You will get a message that the Anodized Rainbow gradient has changed, do you want to save the changes.

- Answer Yes

You will be given a window to name the new gradient.

- Answer Black Band Rainbow
- You will be shown a number of created palettes, select the top one.
- Click on OK

The gradient will be saved in a user area for gradient but the saved gradient will be added to the above window of available gradients
Saved as:

C:/users/rwoud/Corel Paintshop Pro/2021/Gradients/Black Band Rainbow.PspGradient

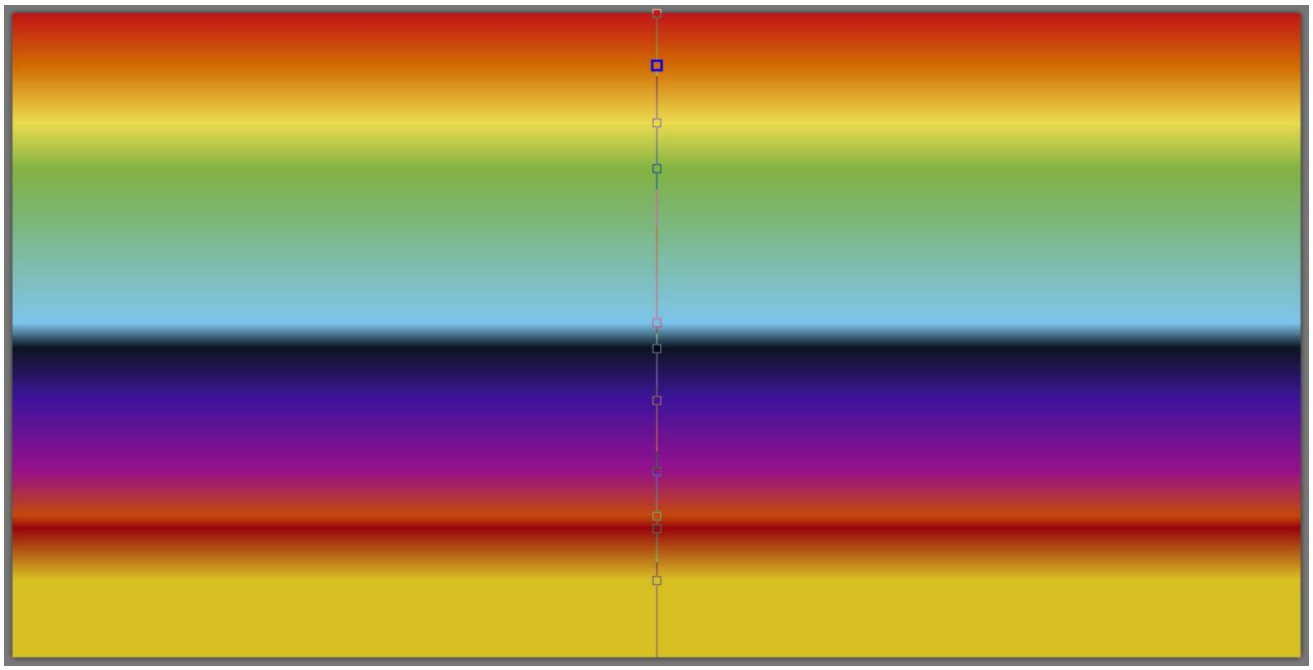
To apply a gradient to the workspace, select one in the **Material Properties** window and make sure the **Gradient Fill** tool is selected.

The cursor will change to a cross-hair and a colour-fill bucket.

- Draw a line from the top to the bottom of the workspace. The angle of the line will determine the angel at which the gradient will be applied.

There is a circular cursor at the bottom of the line:  that will allow 360^{O} readjusting the angle of the gradient pattern.

The gradient line will also show a square for each colour in the gradient to allow for movement/size of each gradient colour.



By selecting a new colour from the panel above the display, that new colour can be added to the gradient at any point on the line by clicking it.

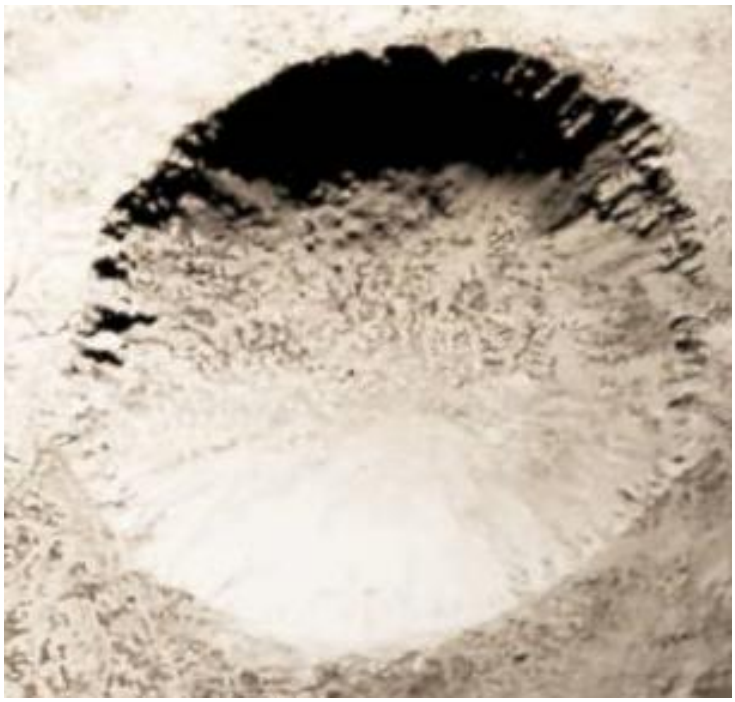
Distortion & Effects

There are a number of effects and distortions that can be applied to the gradient to enhance the planet texture. They are found under the Effects tab.

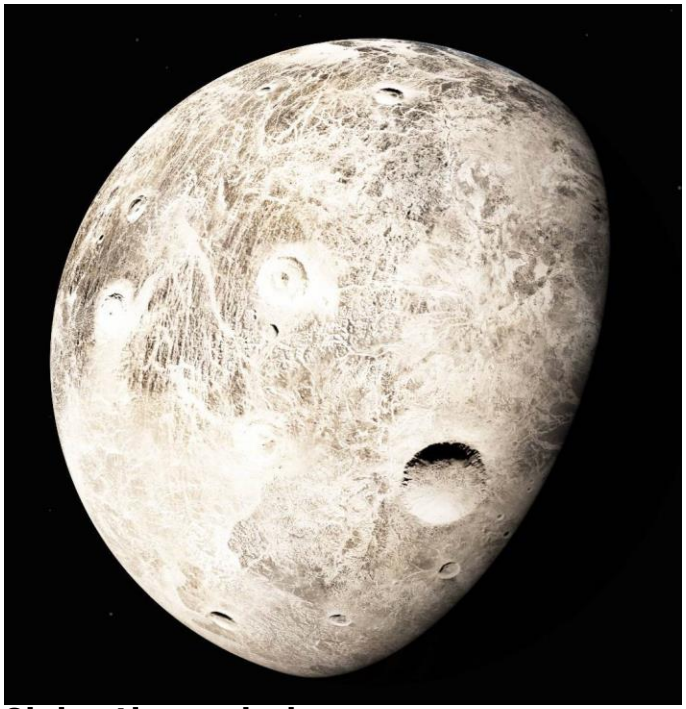
The sky is the limit on the kinds of variations that can be made to the gradient texture though not a extensive as those found in PhotoShop.

Bitmap Resolution

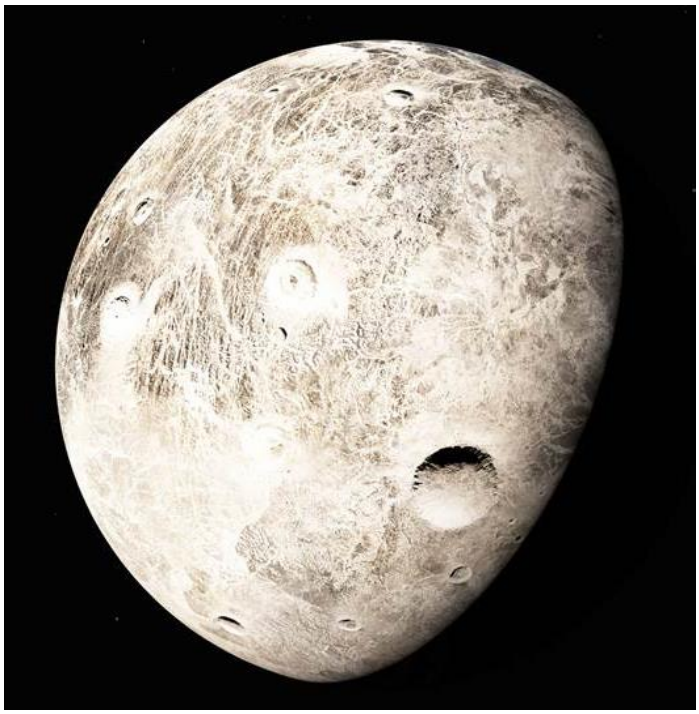
The quality and detail of the produced planet texture is completely dependent on the resolution level of the applied bitmap. In the examples below, the large creator is magnified to show the level of detail.



4k by 2k resolution



2k by 1k resolution



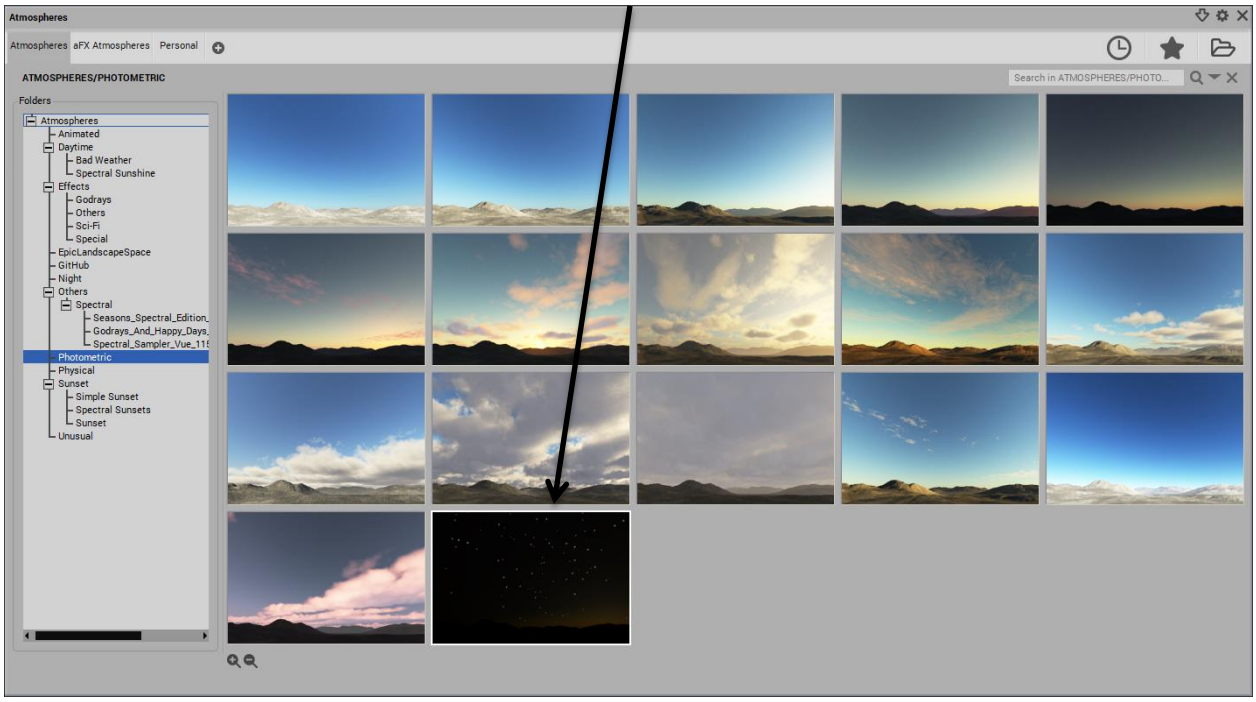
1k by 512 resolution

512 by 256 resolution

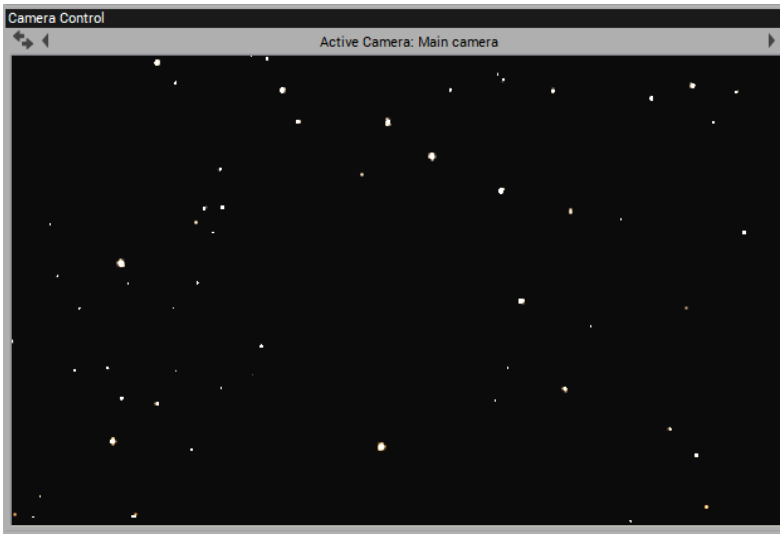
The higher the resolution of the bitmaps applied the better the quality of the final render of the scene will be. It is suggested not to go below 2k by 1k resolution if at all possible.

Planet in the Night Sky

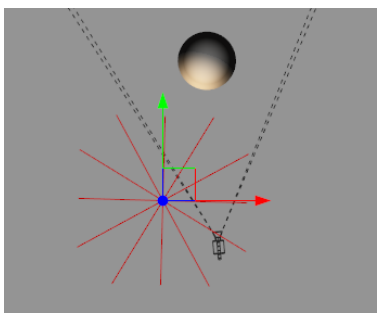
To place the planet in the night sky, right-click the **Atmosphere Editor** icon:  and under the **Photometric** group, select the **Night** atmosphere.

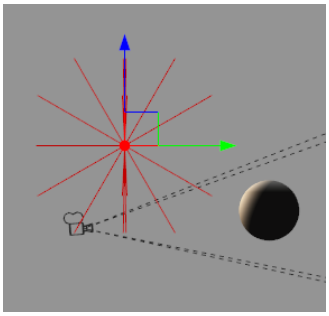


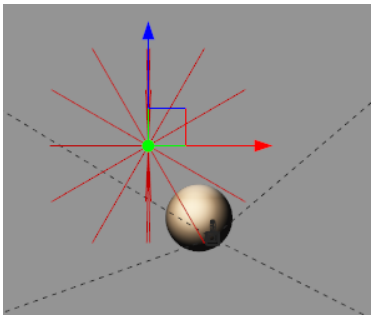
A night sky will appear with stars. The sky is completely black and the planet can't be seen though some stars will be visible.



- From the left tools menu, select the **Point light** icon:  or right-click and select the first item in the list)
- In the Top, Front and Side Views, move the **Point light** in relation to the planet and the camera to achieve a ¾ phase lighted planet again.








Camera Control
Active Camera: Main camera

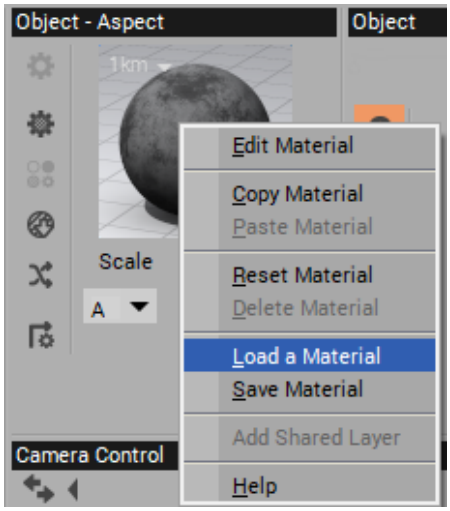
A Planet with Surface variations

- We will begin, as before, with a default, empty scene.
- Insert a default sized sphere and raise it up into the sky a bit.
- Tilt the camera up toward the sphere and center it in the view
- Remove the **Ground** plane.

Surface Material

To give the planet a bit of character in surface, we'll load a **Displacement Material** that has some texture to it as opposed to a simple **Basic Material** that only has some colour variations.

- In the **Object - Aspect** panel, click on the **Load Material** icon: or right-click the sphere and select **Load a Material** from the presented list:

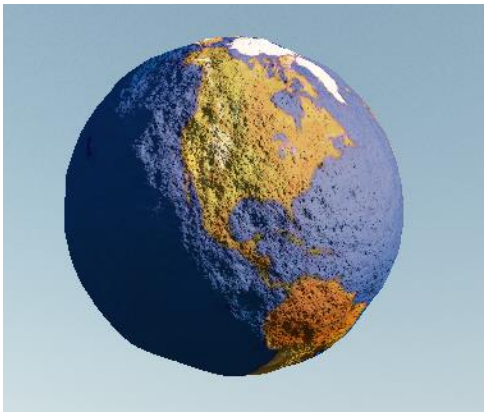


The **Materials** window will be displayed.

- Select the **Displacement Materials** heading to display that group of materials:

We could be dramatic and load this **Fractal** material with its deep surface variations.

But we'll use this more reserved material called **Old Limestone** with some surface variation but not as drastic.



Colouring the Planet

You could use either the **Procedural Colour** or the **Projected Bitmap** method to colour the planet. However, applying a bitmap picture onto the already displaced material may make the result look unrealistic:

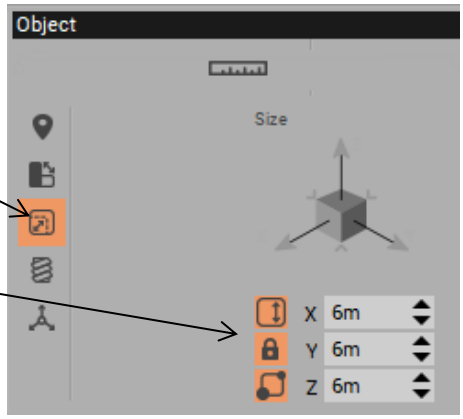
We'll go with **Procedural colours**…..

- Select and/or modify a **Color map** to be applied
- Select a colour distribution **Function** and in the **Object - Aspect** panel, choose a **Scale** of the planet to give the best look.

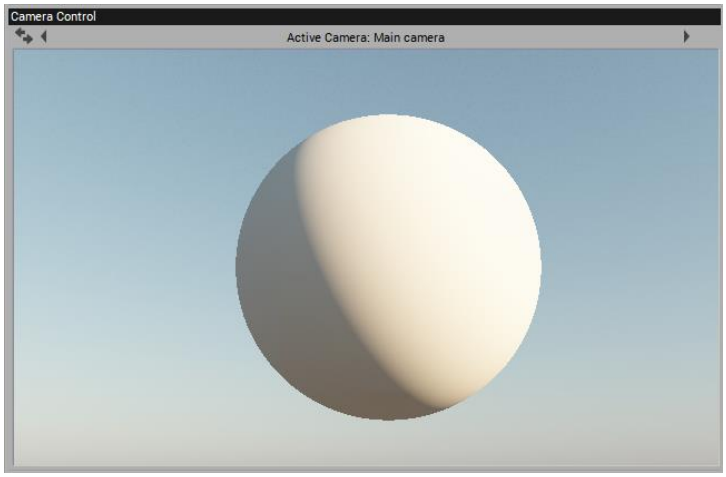
Adding a Cloud layer

We want to add a cloud layer around the planet that might have a few wispy clouds over the planet.
To begin the cloud layer, we want to create a sphere centered exactly on our current sphere and then make it just a bit bigger.

- To do this, select the **Planet** in the World Browser, then right-click and select **Copy**. Then immediately right click the mouse and click on **Paste**. This creates a new sphere, placed exactly over the existing sphere. Rename this new sphere; **Planet Clouds.**
- With the Planet Clouds layer selected, in the Object - Aspect pane, right-click the image and select **Reset Material**.
- To the right, in the **Object** pane, select the size icon.
- With the three icons active, change the X,Y or Z value from 6.0 to 6.2 (they'll all change) to make the **Cloud** layer a bit larger than the planet diameter.

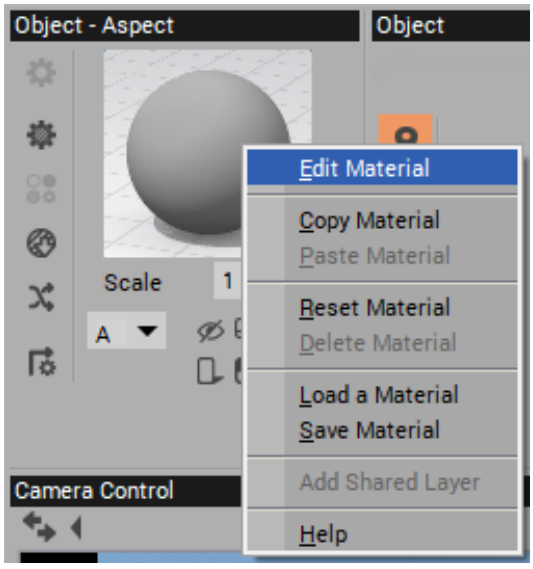


The new Planet Clouds sphere will completely encircle the planet:

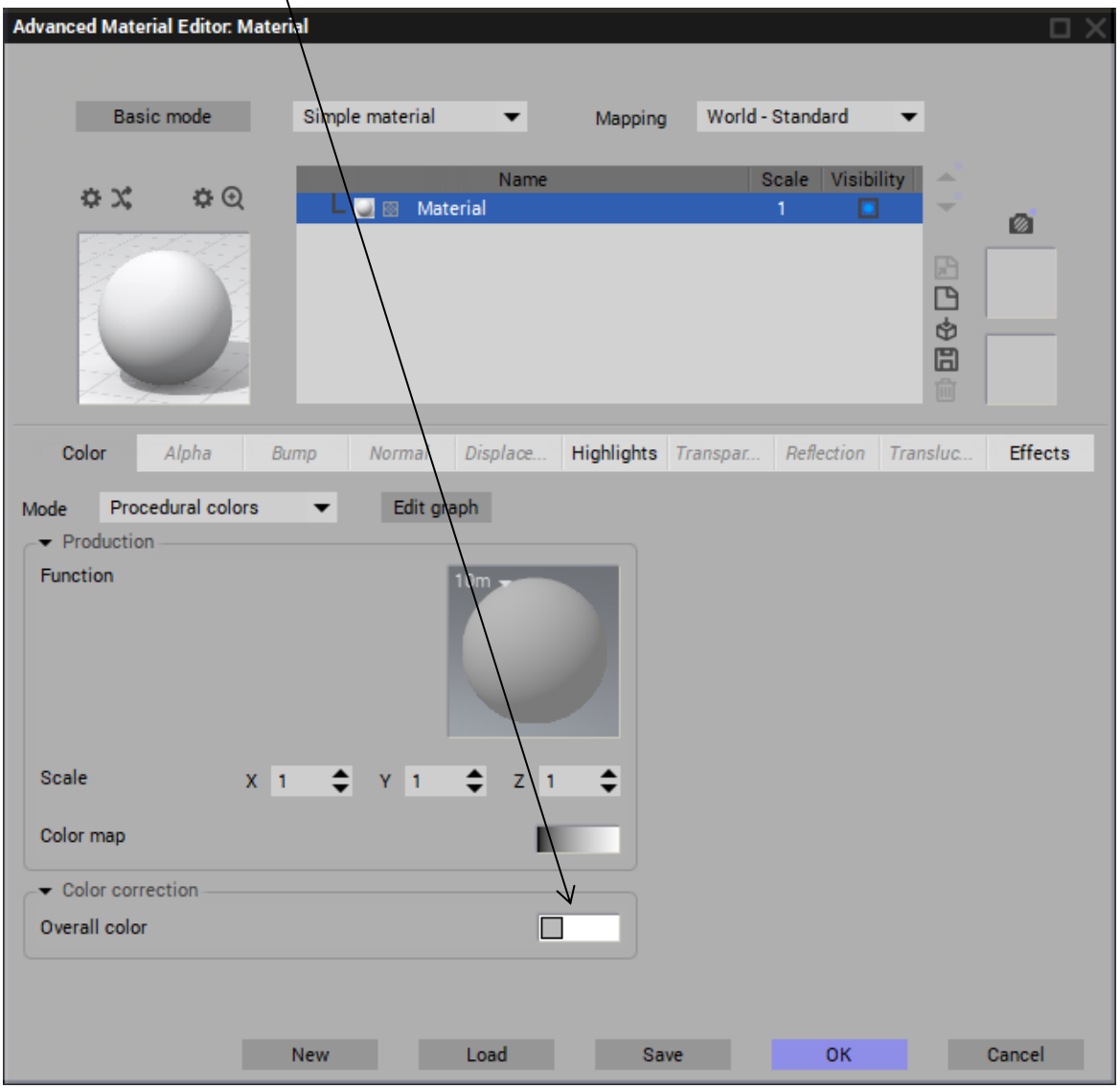


Now we wish to have the cloud layer over the planet as white as possible and wispy.

- Highlight the **Planet Clouds** in the World Browser.
- Right-click the sphere in the **Object - Aspect** panel.
- Select **Edit Material** from the listing.



- Click the **Color** tab of the Advanced Material Editor and change the **Overall color** to fully white.

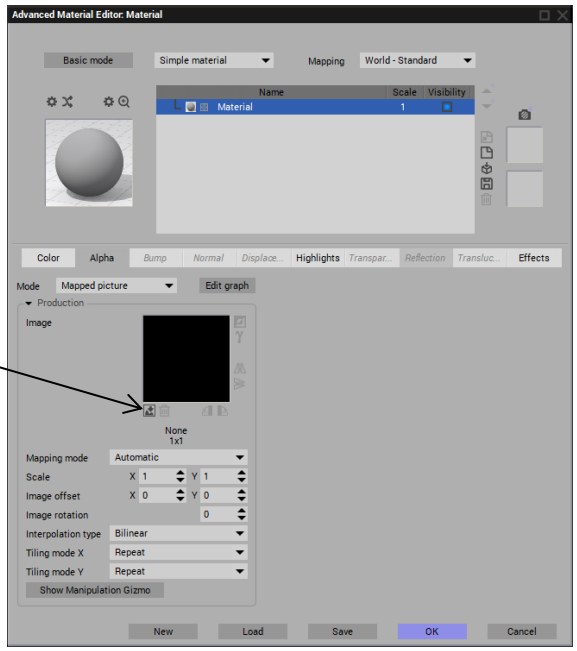


Now click the **Alpha** (transparency) tab of the **Advanced Material Editor.**

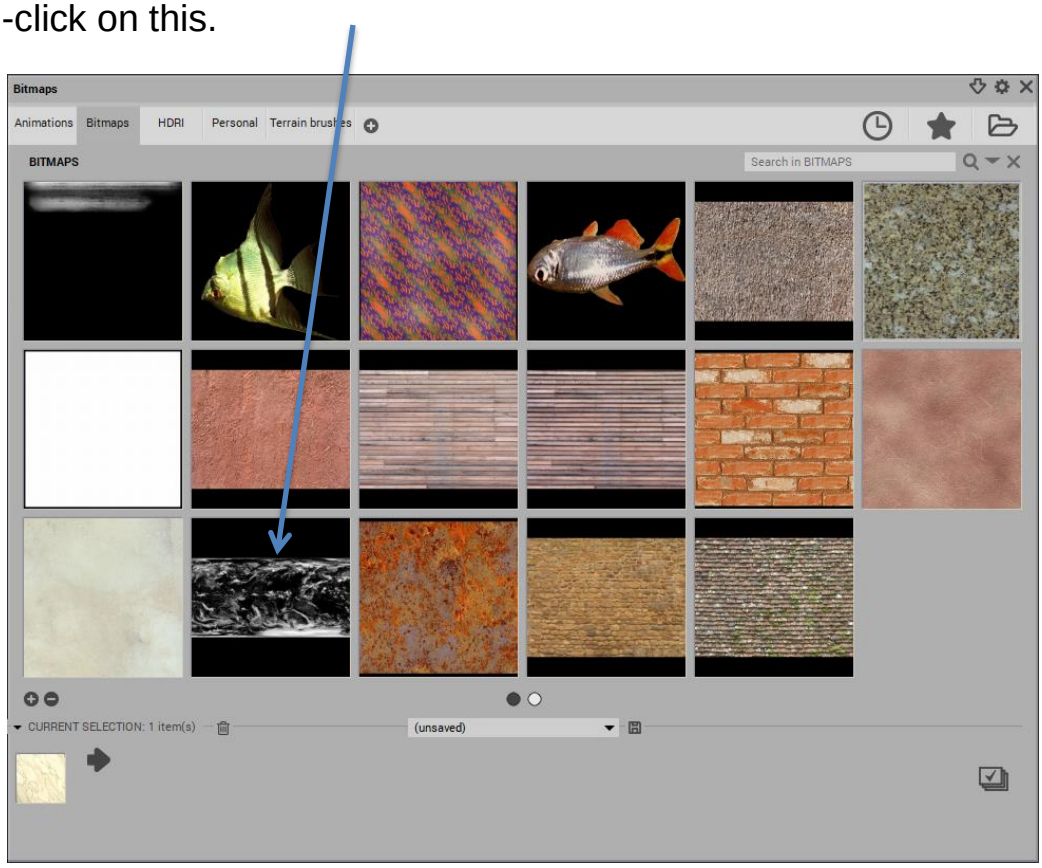
Change the **Mode** to **Mapped Picture**.

When you change the Mode to Mapped picture a window of bitmaps should open right away.

- If it doesn't, click the "load bitmap" box to open the windows of bitmaps.



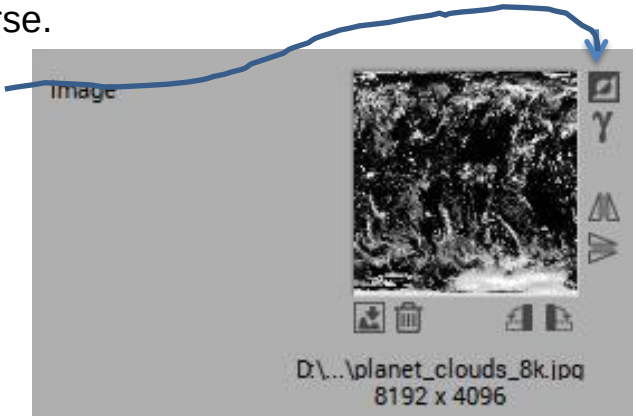
- The default installation of **Vue** includes some basic bitmaps. Included with them is a **Planet_Clouds_8K** bitmap that will work well for the cloud layer. Double-click on this.

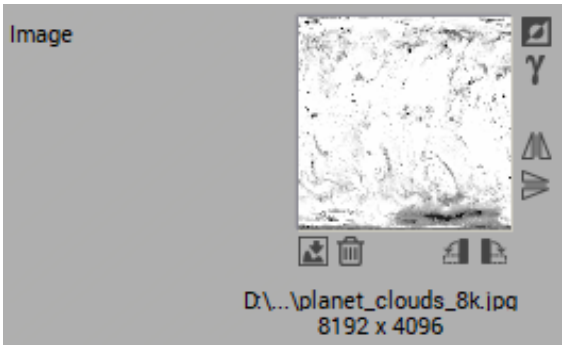


When the bitmap loads, you'll see that most of the planet is covered in clouds (white).

This is because the black area of the bitmap is creating the white cloud area on the sphere. What we want is the reverse; to have the white area of the bitmap to become the clouds, just the inverse.

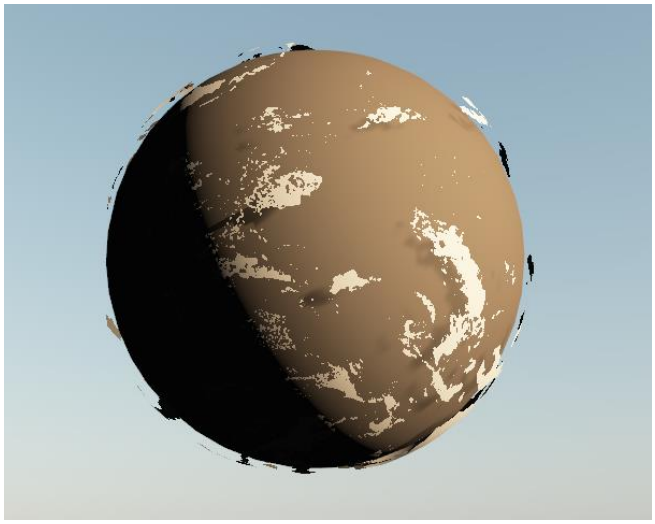
- To do this, click the **Invert** button at the upper-right of the bitmap thumbnail image.

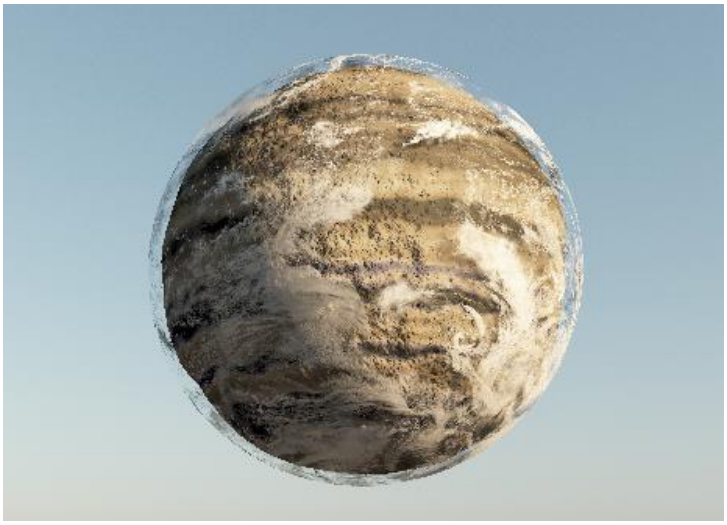




As a result, most of the planet area is clear with some areas of cloud.

The resulting planet has a layer of random clouds:





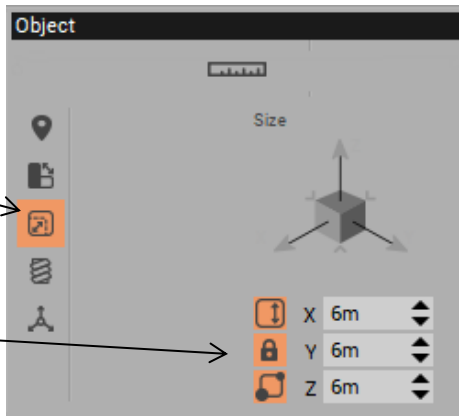
It would be useful to be able to rotate the cloud layer around the planet to offer the best view of the clouds relative to the planet colouring.

- To do this; with the **Advanced Material Editor** still open at the **Alpha** tab change the **Mapping** at the top of the Advanced Material Editor window to **Object - Parametric**. Then click **OK** at the bottom
- Highlight the **Planet Clouds** in the **World Browser**
- Use the rotational (only!) grips in the top, front & side views to rotate the cloud layer around the planet until you have acceptable view.

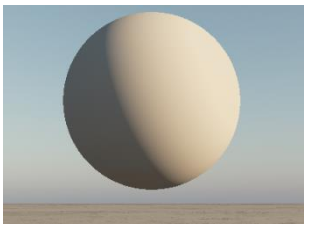
Atmosphere Layer

Now we would like to add an atmospheric layer around the planet that might offer a bit of a glow or halo effect in the sunlight.
To begin the atmospheric layer, we want to create a sphere centered exactly on our current sphere and then make it just a bit bigger.

- As we did earlier with the Cloud layer, select the **Planet Main** in the World Browser, then right-click and select **Copy**. Then immediately right click the mouse and click on **Paste**. This creates a new sphere, placed exactly over the existing sphere.
- Rename this new sphere; **Atmosphere.**
- With the **Atmosphere** selected, in the Object - Aspect pane, right-click the image and select **Reset Material**.
- To the right, in the **Object** pane, select the size icon.
- With the three icons active, change the X,Y or Z value from 6.0 to 6.4 (they'll all change) to make the atmosphere layer a bit larger than the planet diameter and cloud layer.



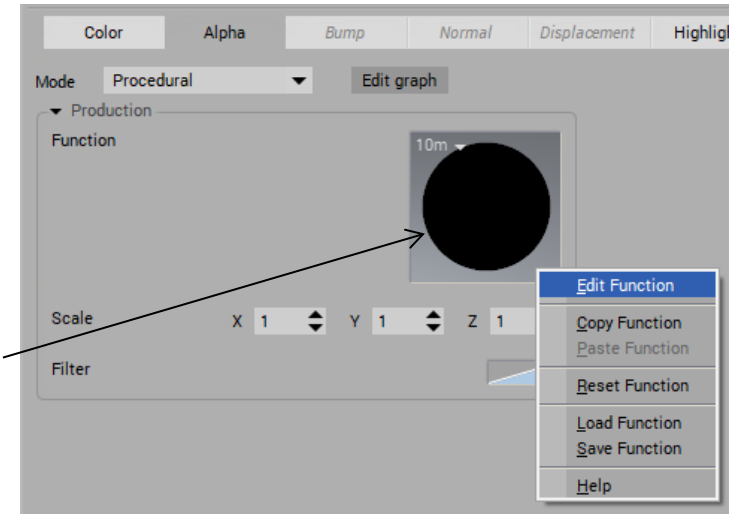
As with the cloud layer, this new Atmosphere sphere will completely encircle the planet:
We want to make the atmosphere somewhat transparent, like a haze around the planet and not an opaque material. The transparency of a material is referring to its **Alpha** parameter.
If we look directly perpendicular to the planet, we should not see the atmosphere haze at all but if we look across the edge of the planet we should see some haze quite clearly. This effect results from the "Angle of Incidence" of the sightline across the atmosphere.



- In the **Object - Aspect** pane, right-click the **Atmosphere** image and select **Edit Material.**

In the **Advanced Material Editor** , select the **Alpha** tab and set its **Mode** to **Procedural** if not already at that setting.

Then in the **Production - Function** black circle, right-click and select **Edit Function** to open the material's **Alpha Production** function graph:

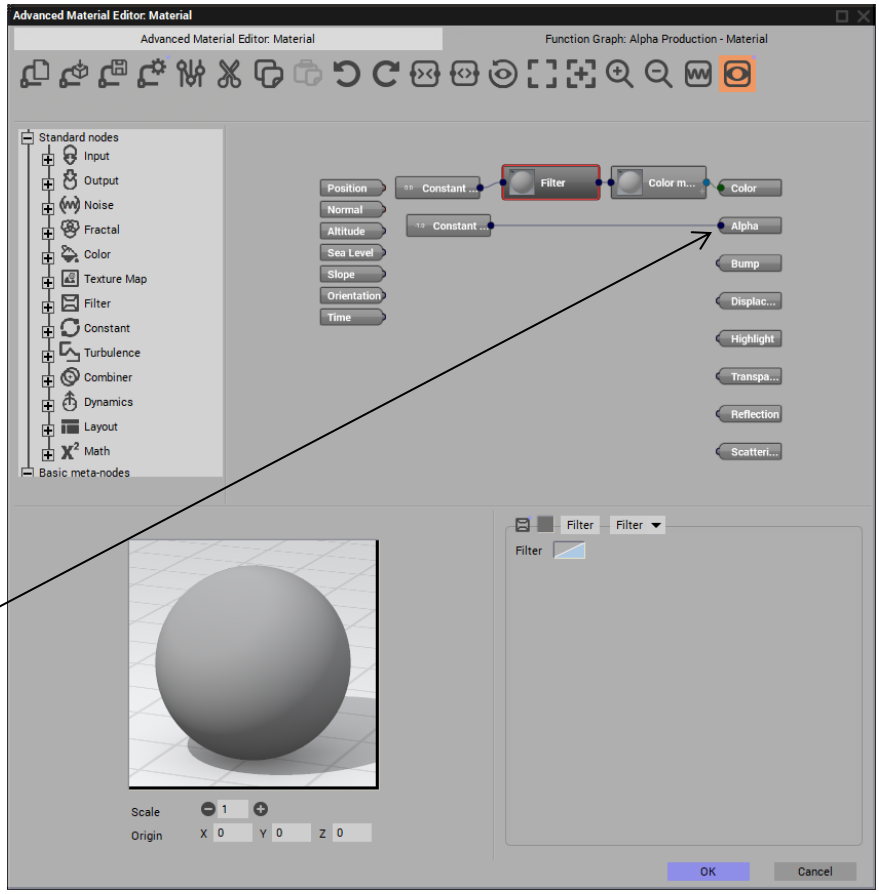


Function Graph:

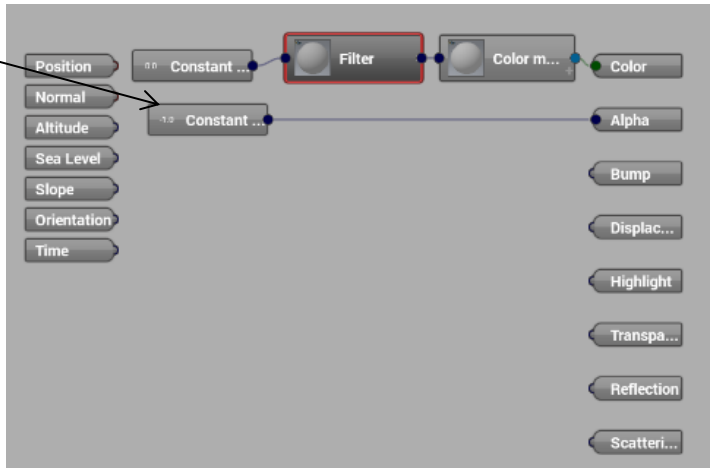
The left labels are input parameters to the function.
The right labels are outputs from the graph that influence various parameters.

Between them, various functions can be placed, connected and adjusted to further influence the outputs.

We want to influence the **Alpha** output.
First we'll delete it's the **Alpha's** connection to the **Constant** function.

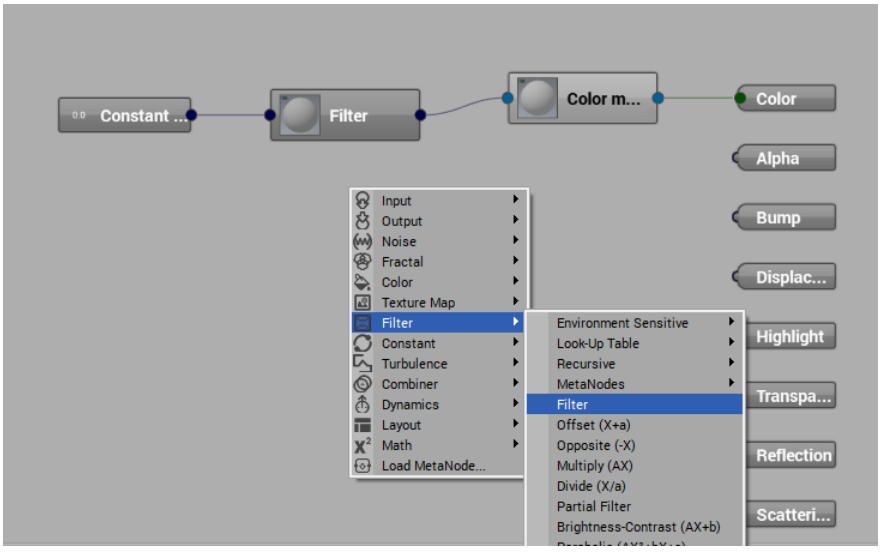


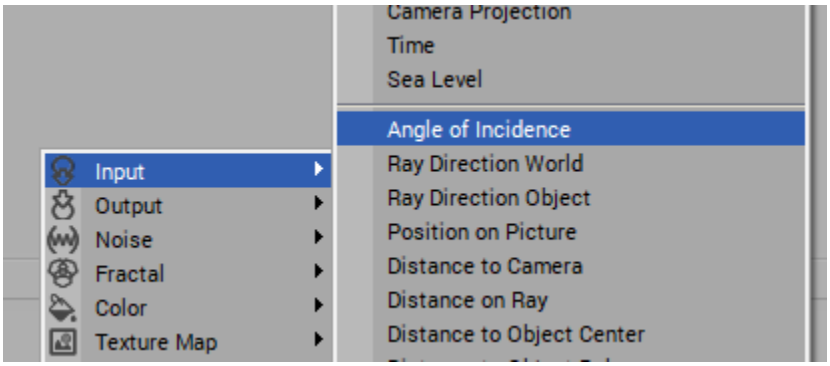
- Click on the Alpha-connected **Constant** node to highlight it. Then delete it. Its connection to the **Alpha** output will be deleted as well.



- Right-click the mouse anywhere in the open graph area and highlight: **Filter** from the displayed list.

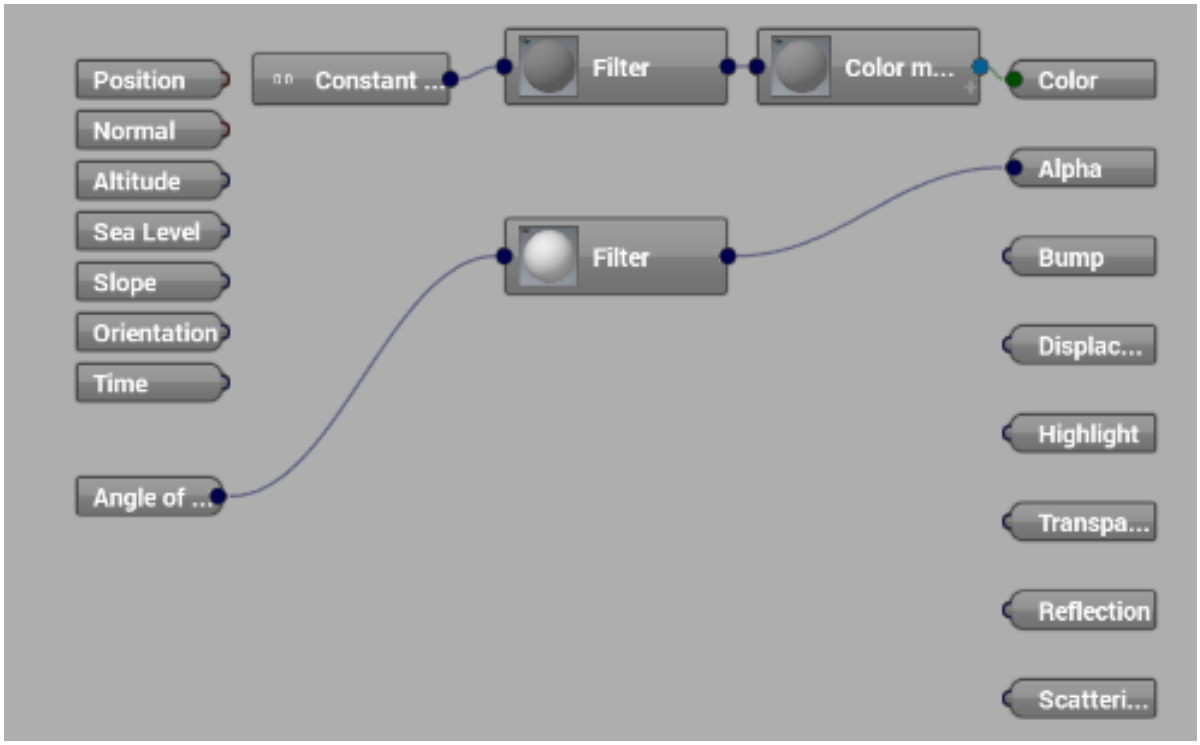
- From the second displayed list, select **Filter** again to insert a filter onto the graph.



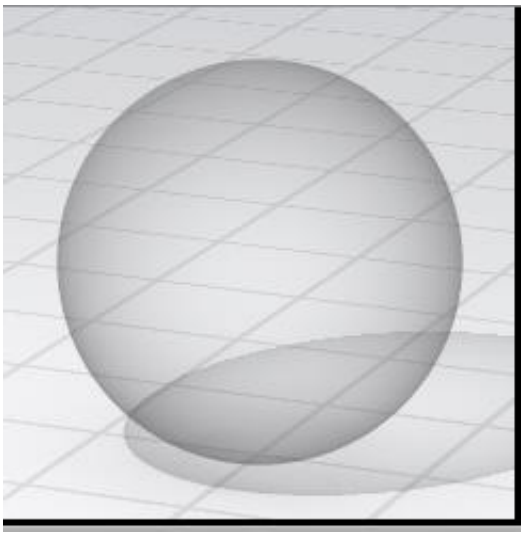


- Right-click the mouse again and highlight **Input** from the list.
- From the second displayed list, select: **Angle of Incidence**.

- Use the mouse to draw a connection line from the left side of the **Alpha** to the right side of the **Filter** and then from the left side of the **Filter** to the right side of the **Angle of Incidence.**



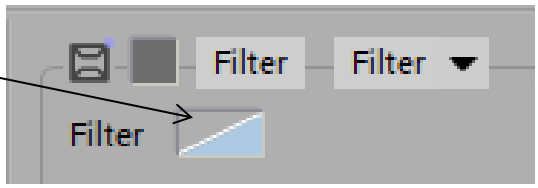
You will see that the sample sphere below the graph already has a variable transparency from it center to its edge and the Planet atmosphere reflects this.



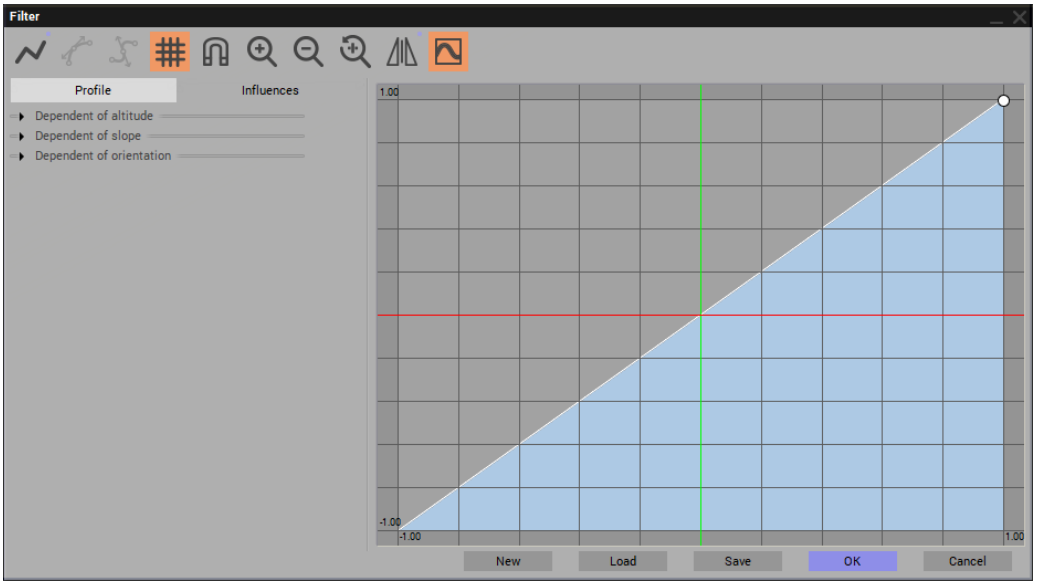
Atmosphere Density Profile

We would like to make the atmosphere appear thinner near the center and thicker toward the edges and have a bluish tinge.

- Highlight the graph **Filter** that was just added to the graph (red border).
- Now right-click on the small **Filter** window in the lower right pane and select **Edit Filter**.



This will open the **Filter** graph itself for editing.

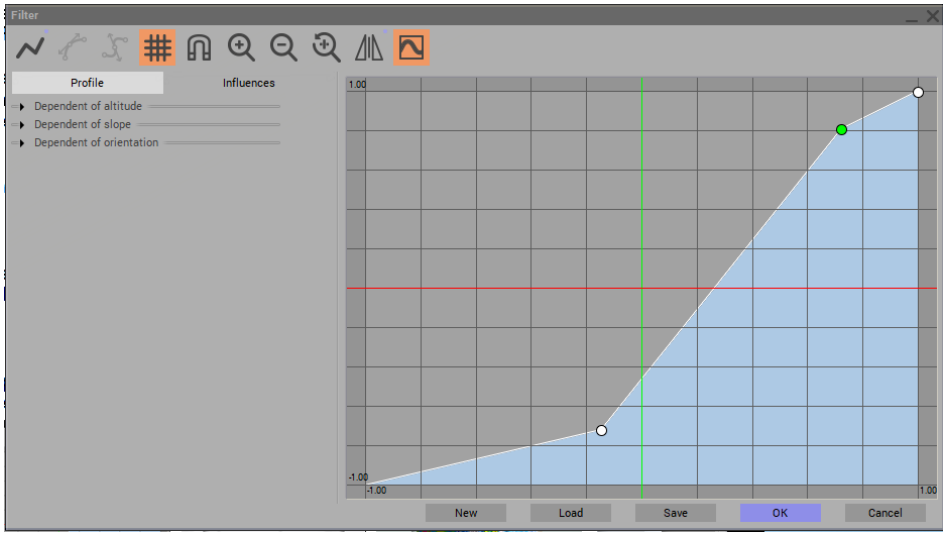


Double-click on the lower-left part of the graph line to place a Key node there.

Do the same for the upper-right part of the graph line.

Move the two node points around to alter the diameter and density of the atmospheric haze ring.

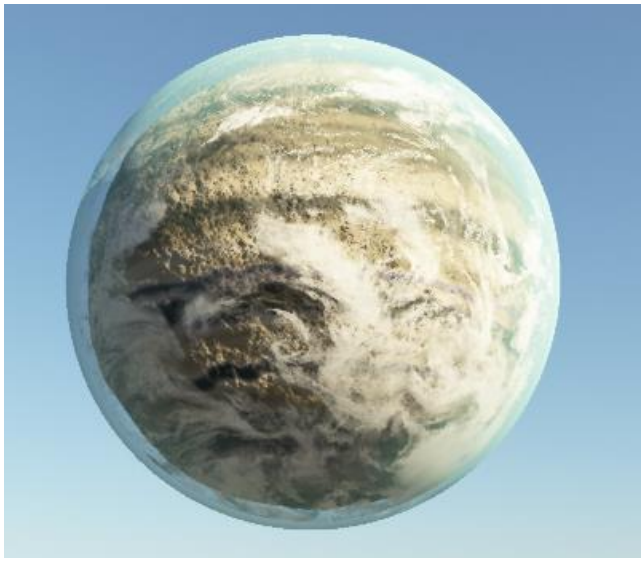
Once you are happy with the atmosphere graph, click OK.



At the top of the **Function Graph: Alpha Production**, click on the right side, on the **Advanced Material Editor** again, then select the **Color** tab at the left-most side.

Click on the **Overall color** square and select a nice blueish colour for the atmosphere.

The result is a planet with a layer of clouds obscuring portions of the planet and an atmosphere that is more apparent at the edges of the planet surface than when looking directly perpendicular at the surface.



Right now the outer edge of the atmosphere seems quite abrupt even though it is somewhat transparent.

There is probably a way within the preceding alpha function to make the outer edge of the atmosphere more “fuzzy” but one way is to use some **Glow** effect on the atmosphere or planet.

First, it will be useful to place the planet into a night sky. Once we’ve done this we will take a second look at making the atmosphere around the planet more realistic.

Completing the Night Sky

Now that we have the planet and atmosphere pretty well where we like it, we need to set up the night sky background to the planet.

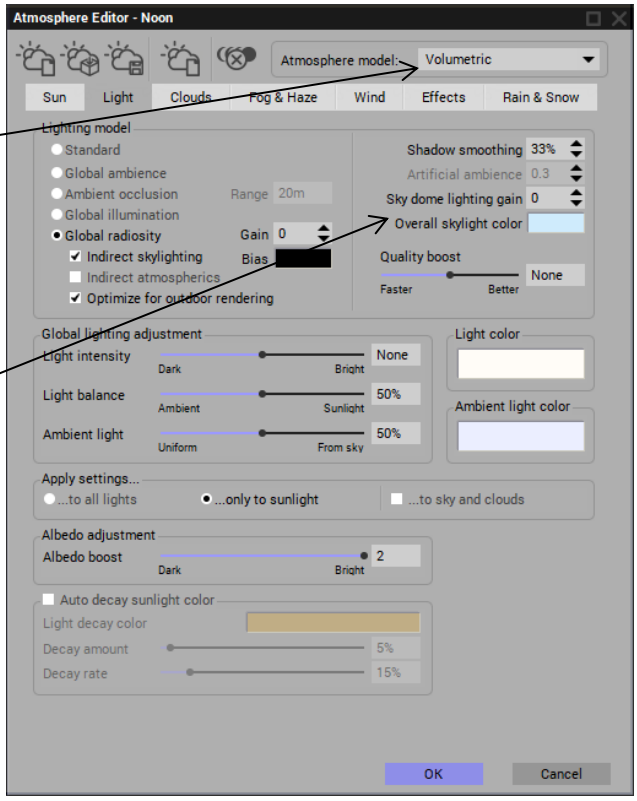
Open the **Atmosphere Editor**: 

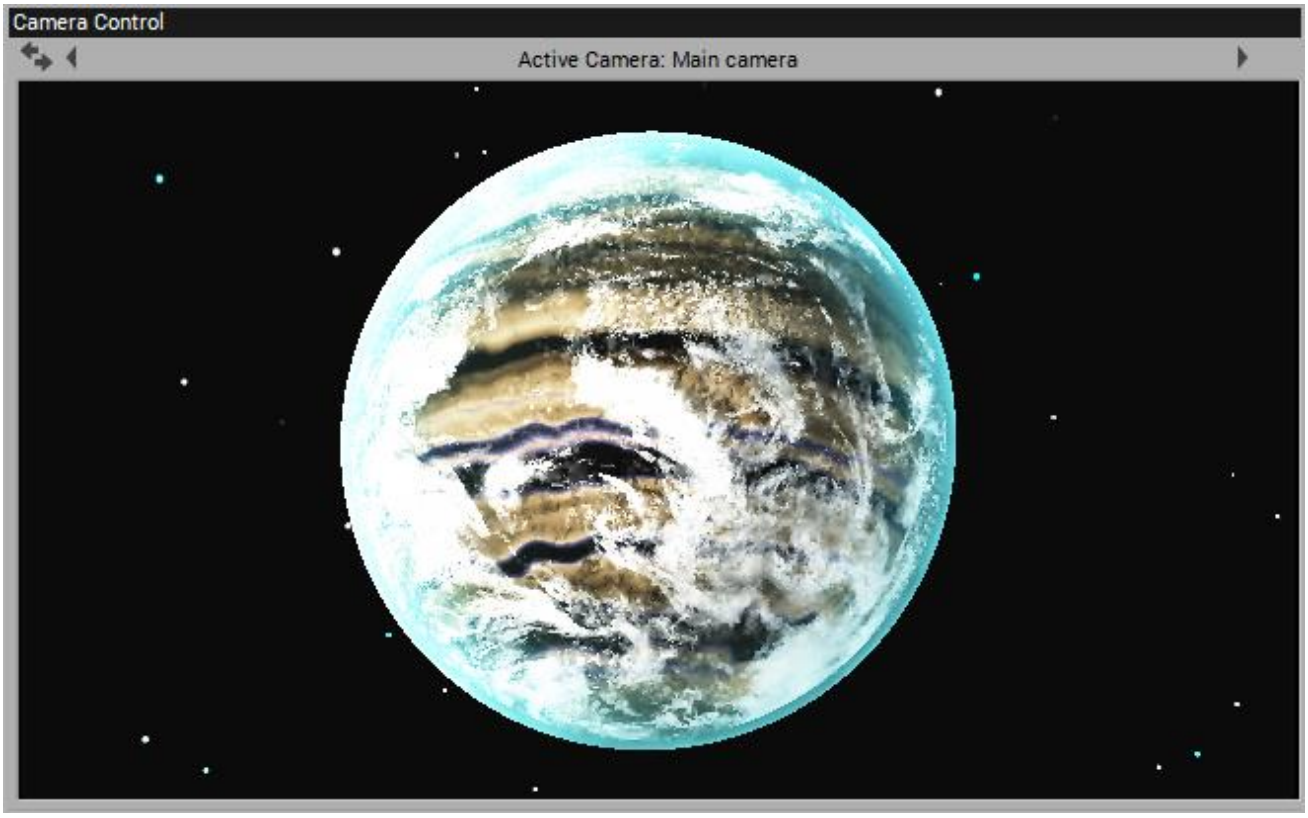
At the top of the Atmosphere Editor set the **Atmosphere model** to **Volumetric**.

Under the **Fog & Haze** tab set both to zero. Sky should now be black.

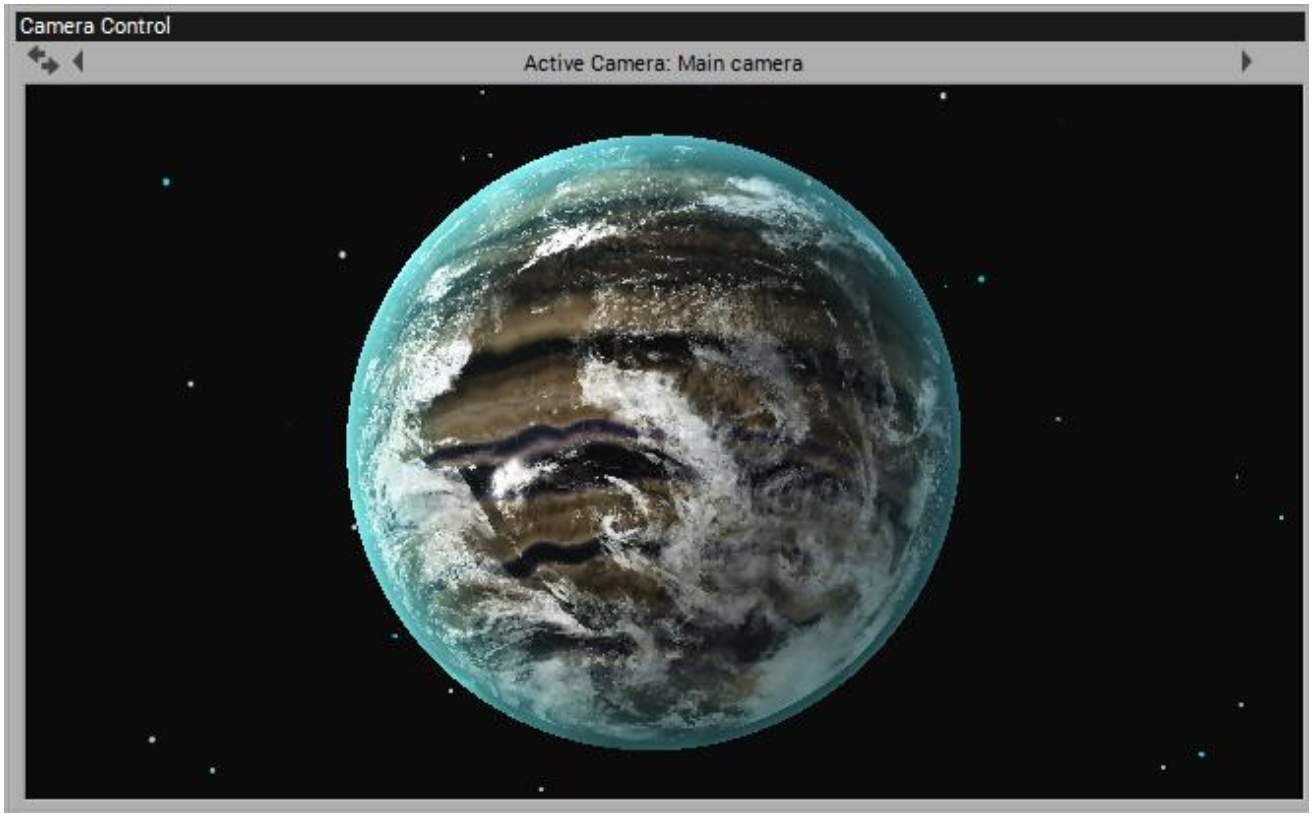
Under the **Light** tab set the **Overall Skylight color** to mostly the white side of blue.

Under the **Effects** tab, check the **Stars** box. Set the **Number of stars** to 100%, the **Brightness** to 50%, **Twinkle** to 0% and check the **Colored stars** box.



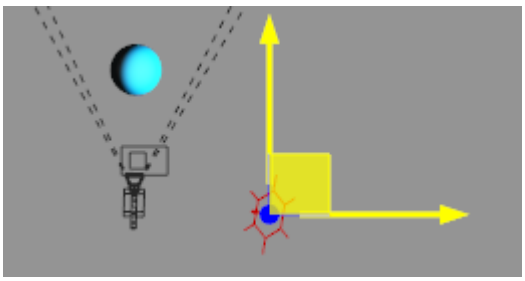


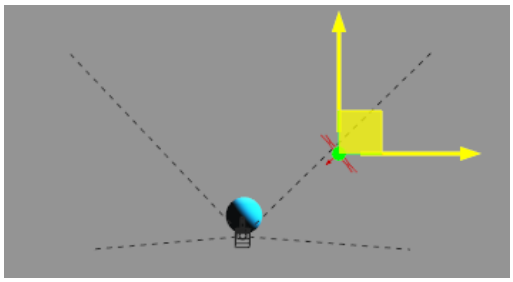
The extreme brightness of the planet image is a result of the **Main camera Auto-exposure** being set to **On** and an exposure level of zero.
You can either turn the Auto-exposure off, or leave it on but adjust the exposure level downward until a more acceptable brightness is found.

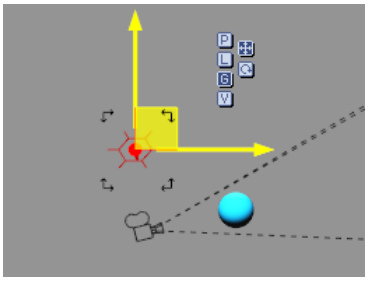


We'll manipulate the sun position and it's direction for planet shading and phase. Note that by default, the sun will always be pointing toward the main camera.
To remove this, with the **Sun light** highlighted in the **World Browser**, uncheck the **Point at Camera** checkbox in the **Object - Aspect** panel. Remember that the direction that the sun now points is dependent on the sun rotation <u>you</u> apply using the rotational grips in the top, front & side views

- Select the **Sun light** in **World Browser**. You can play with the position of the sun to change the direction and phase of the planet.





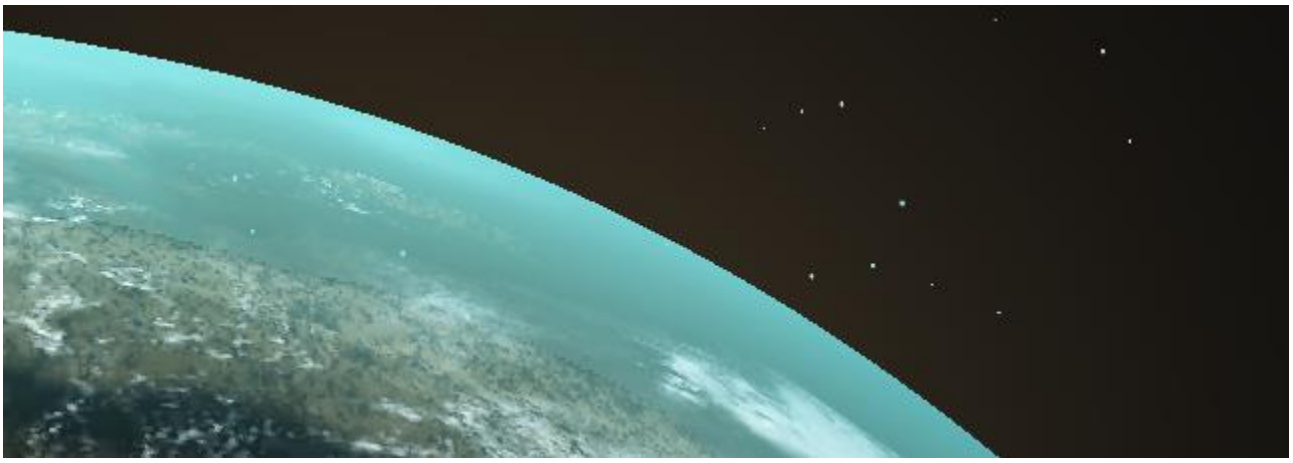


Adjusting the Atmosphere

We would like to make the atmospheric layer around the planet less abrupt and give it a fuzzier look like space photos of the earth would show:

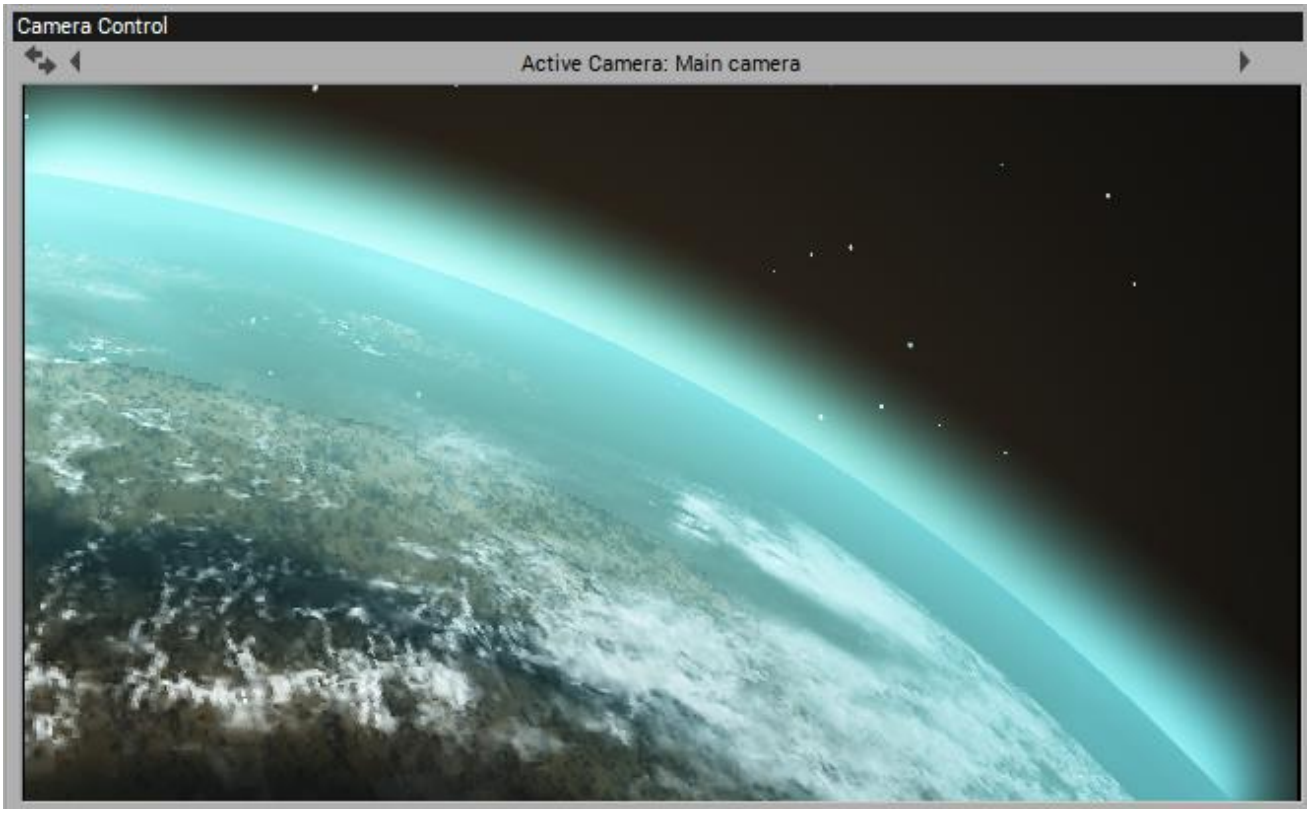
Our example planet has a cloud layer and also an atmospheric layer. It is best to apply the glow effect to the outer-most layer, in our case, the atmospheric layer.

- First, zoom in so that the planet view is arranged similar to the earth photo above:

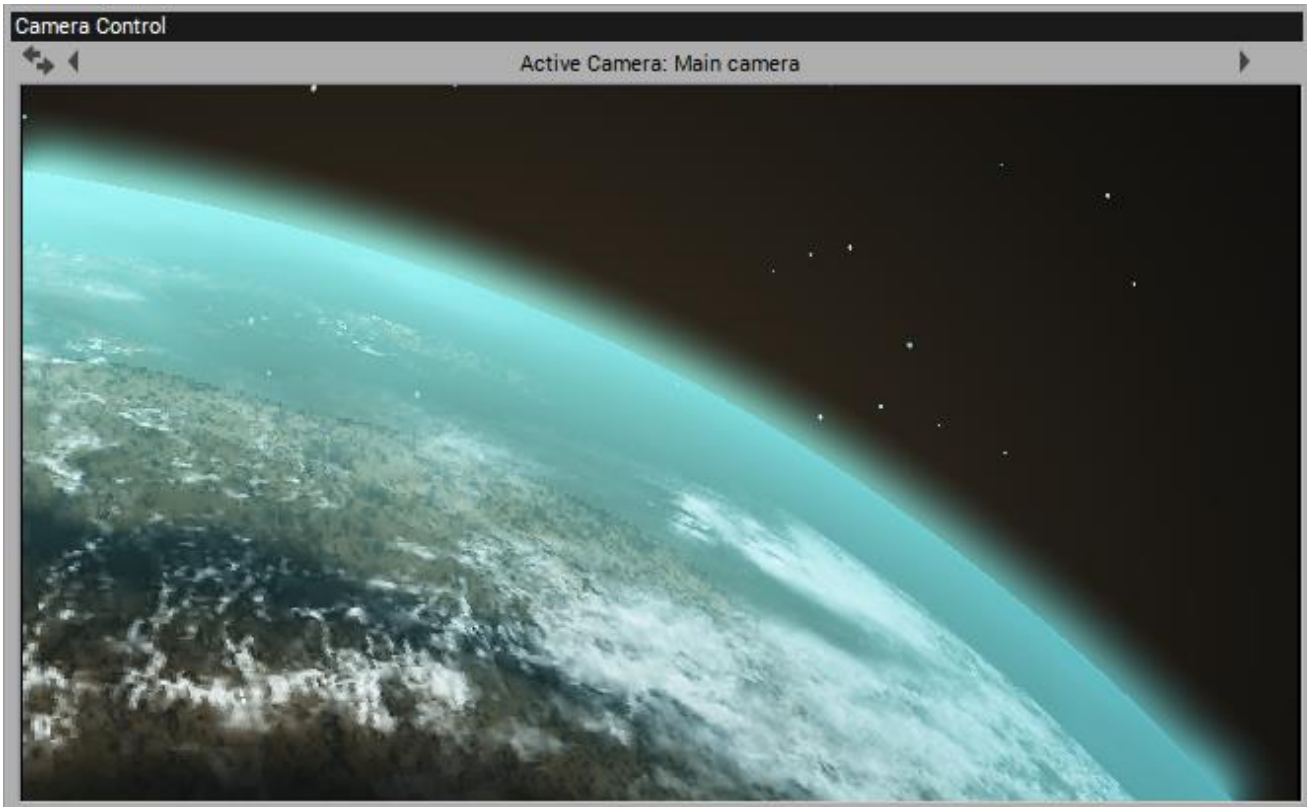


- Highlight the **Planet Atmosphere** in the **World Browser** and open its **Material Editor**.
- Open the right-most **Effects** tab and activate the **Glowing material** check box
- Begin with a relatively small Radius of 2% and a relatively high Intensity of 80%

Glowing material effects are computer resource intensive and time consuming to render. Even the **Preview screen** will take some time to illustrate the resulting effects of any changes made to the **Glowing material** parameters. Be patient, it may take a few minutes to even see the preview result:

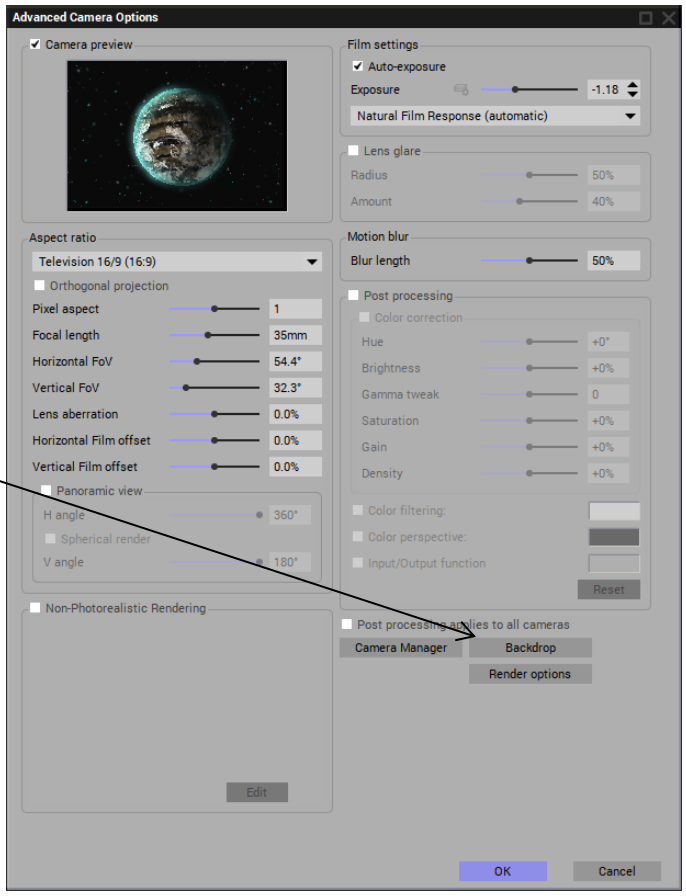


For a less dramatic effect, Radius = 1% and Intensity = 50%



Adding a Background to the Space Scene

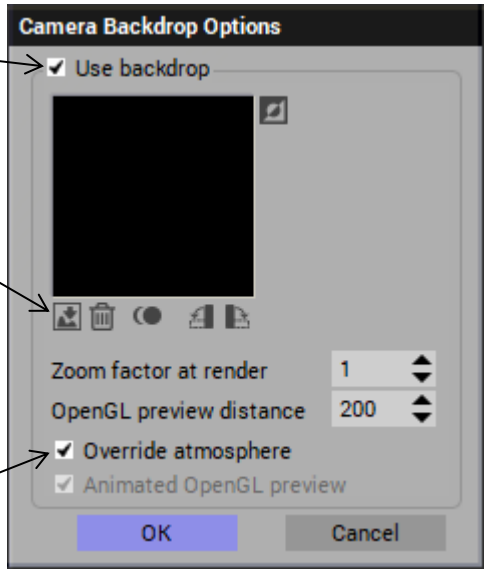
- Double-click the **Main Camera** in World Browser to open the Advanced Camera Options window:



- To set up a backdrop image onto the background, click on **Backdrop** at bottom-right.

- In the displayed window, click on **Use backdrop** box.

- Click the **load Bitmap** button to search for an appropriate bitmapped image to be used as the backdrop for the space scene.



Try to use bitmaps that have similar resolution and aspect ratio as the render options are using.

Uncheck the **Override atmosphere** box if you wish to retain the stars that were placed in the scene earlier.

Try a full Render of the scene:

Note that the backdrop bitmap image may be of varying aspect ratios and resolutions and as a result, may not appear in the preview window in the same way they will look in the final render.

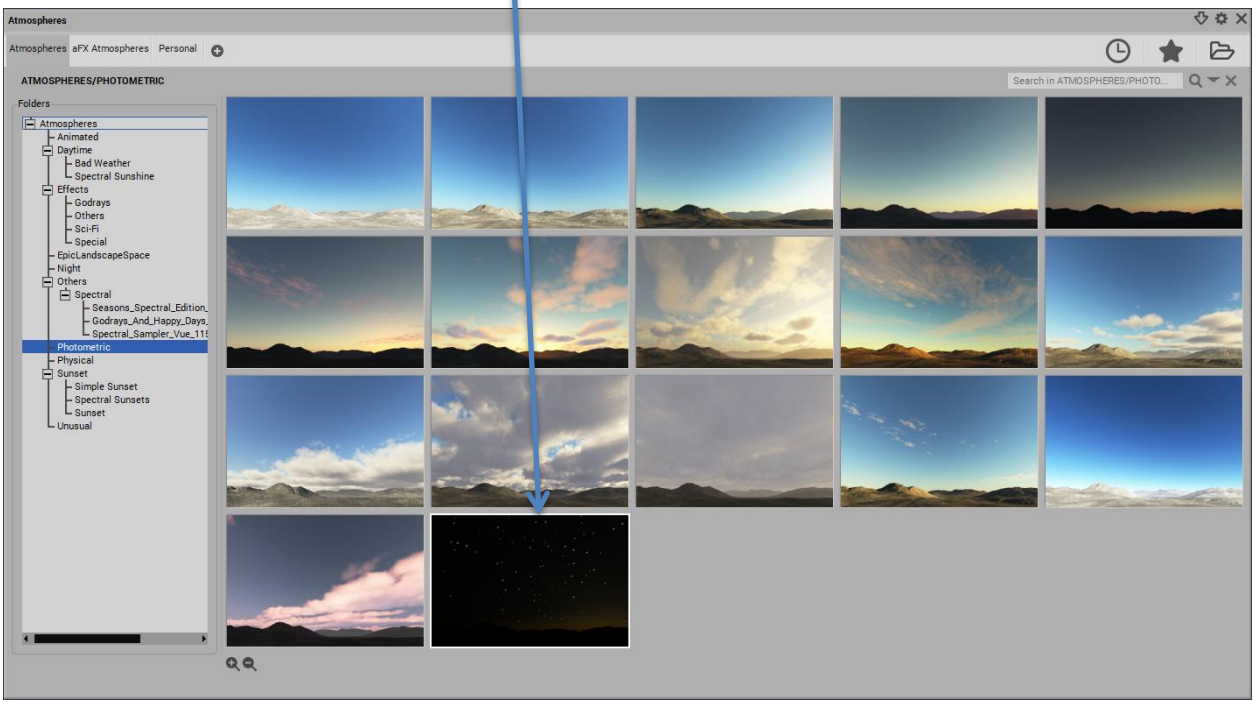
If this becomes the case, in the **Camera Backdrop Options** window, try different values of **OpenGL preview distance**.

Planet Rings

Planets can have Saturn - type rings placed around them. This can usually be done by inserting a Torus into the scene around a sphere.

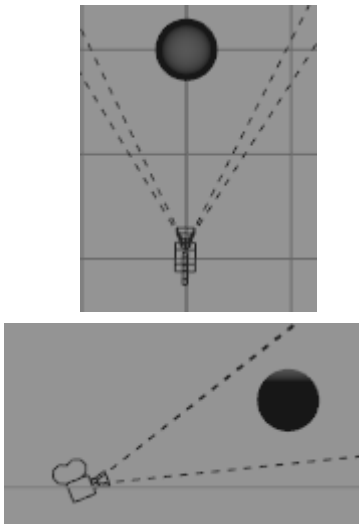
New Scene

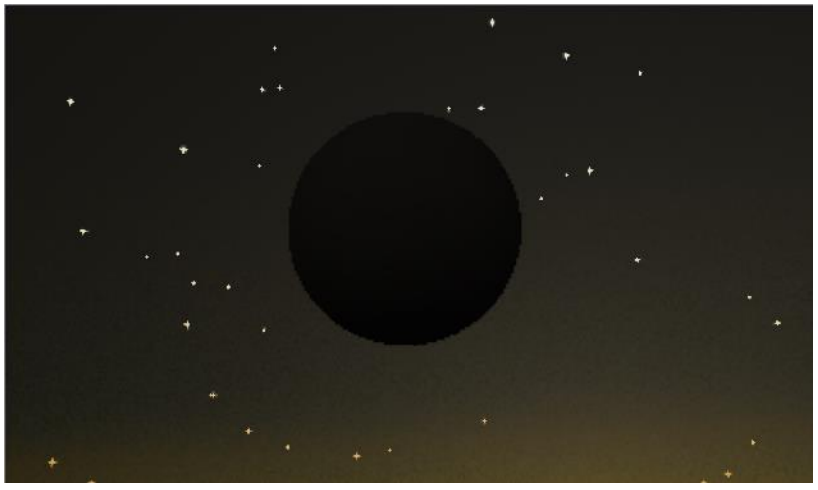
We'll begin by starting a new **Empty** scene.
For our atmosphere this time we'll use the **Night** sky from the **Photometric** group of stock atmospheres:



(The photometric version of Night places the sun below the horizon but allows a small amount of light into the sky to outline the elements in the sky)

Now add a sphere to the scene and raise it well above the ground plane and adjust the camera angle so only the sphere is visible to the camera:

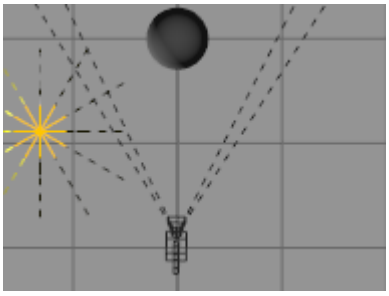
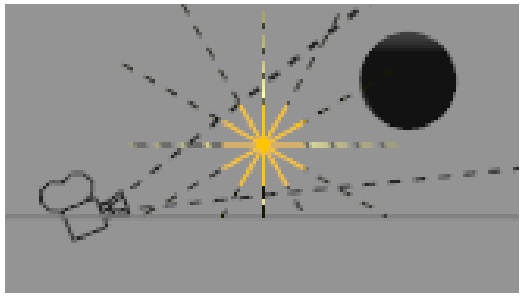
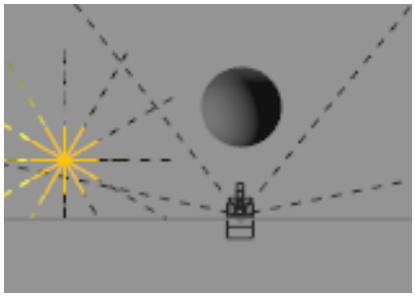




Point Light

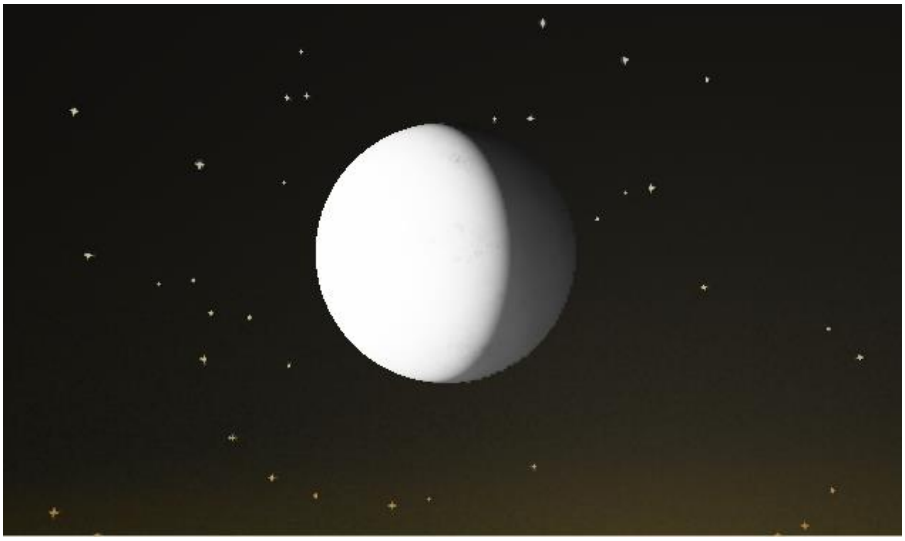
To illuminate the sphere, add a Point Light to the scene:  The point light will immediately illuminate the sphere.

Adjust the point light to the right and back of the sphere and approximately level with it to place the sphere in about a ¾ planet phase. The default power of the point light will be at 5. Moving the point light closer or further away from the sphere, or changing the point light's **Power** level in the **Object - Aspect** panel can adjust the brightness of the sphere.

With the sphere highlighted, select the **Load Material** icon:  From the **Object - Aspect** panel.

For now we will set the sphere material to be the **Flat White** material from the **Basic** materials group. So far, we have a pure white planet:



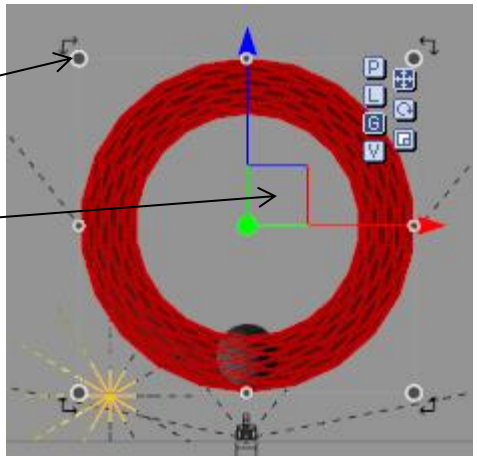
Add a Torus to the planet

Now right-click on the **Sphere** icon on the left-most toolbar: and select the **Torus** from the list. (the Torus now becomes the default icon for primitive shapes on the tool-bar).

The torus is placed in the scene right where the sphere is, it may even appear buried in the sphere.

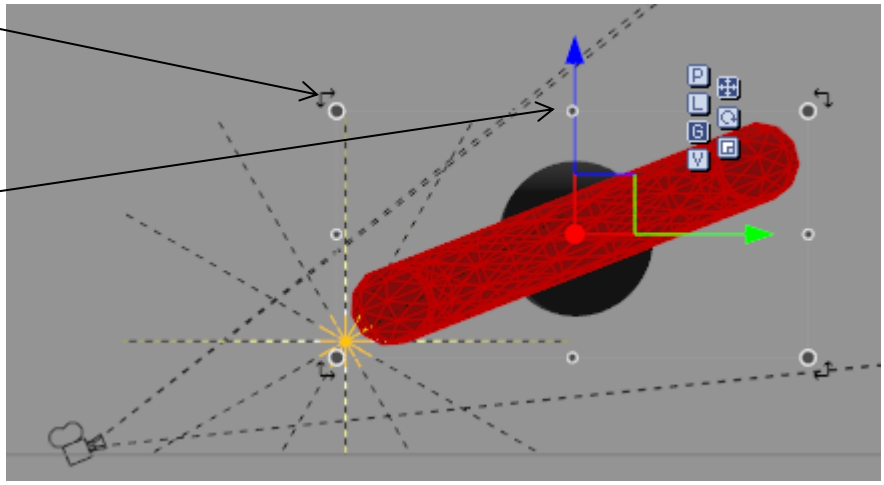
First enlarge the torus using the sizing grips until the torus can easily surround the planet.

Then use the X-Y gizmos to move the torus such that the planet is placed in the torus's center.

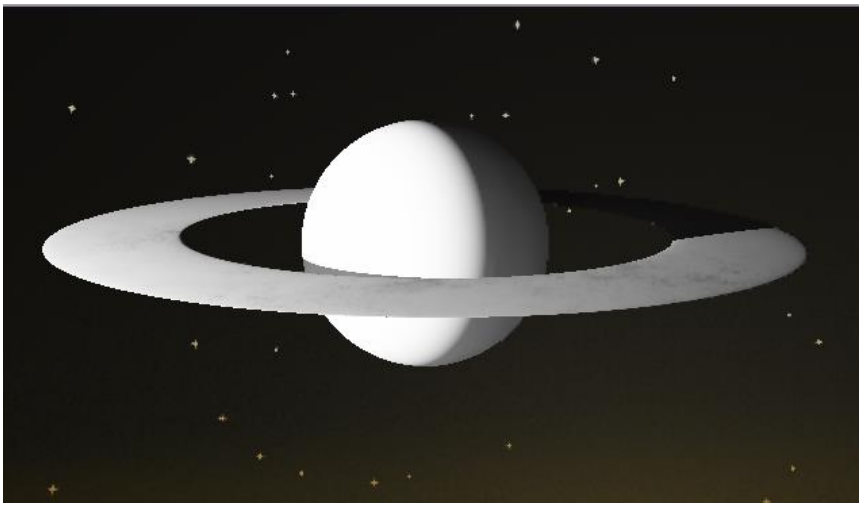


Then use the rotation grips to tilt the ring (torus) in a viewable orientation to the camera.

Finally, use the **Y** directional sizing grips to flatten the torus to the general shape of Saturn type rings.



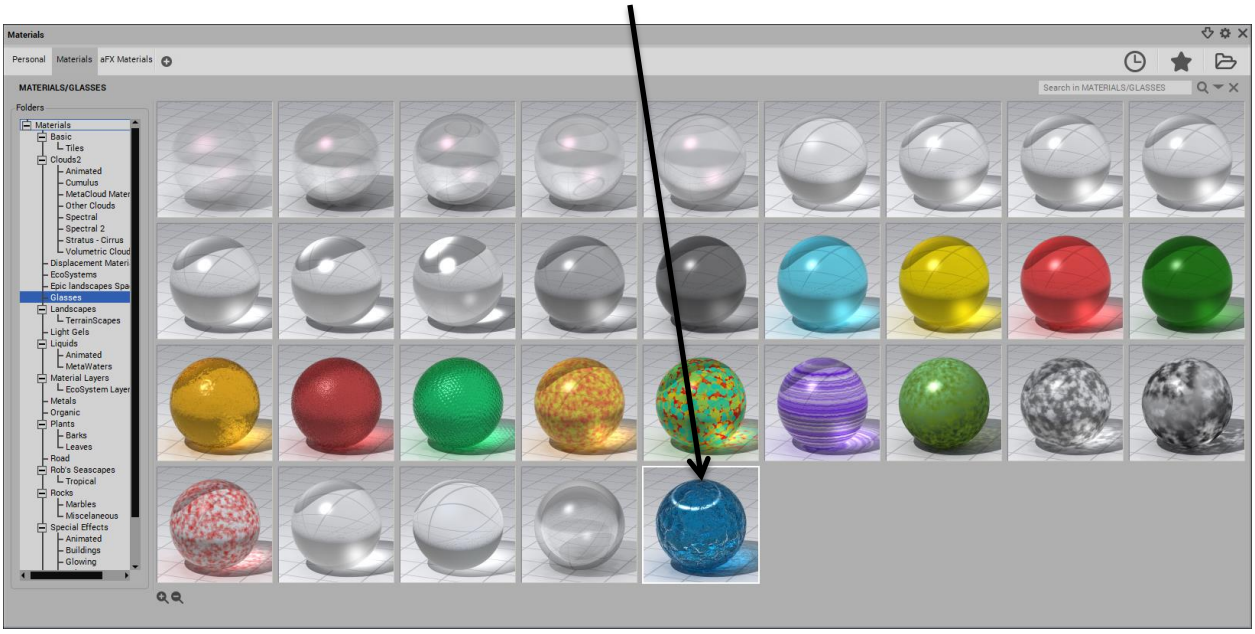
Play around with these grips and gizmos until the camera preview window looks about right.



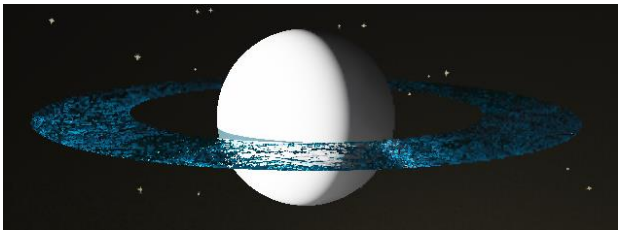
Selecting Ring Material

Now we wish to select and interesting material for the planet ring. Highlight the ring in the World Browser list and, as before, click on the Load Material icon:  in the Object - Aspect panel.

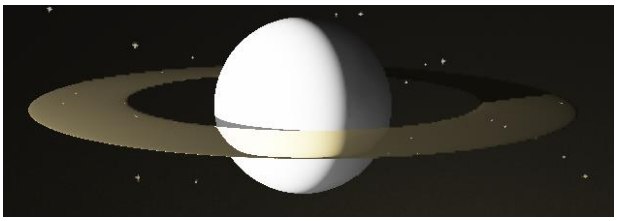
There is a vast array of materials that could be applied to the rings. For example, Select the **Crude Blue Glass** from the **Glasses** group of materials:



This gives an interesting, random look to the rings.

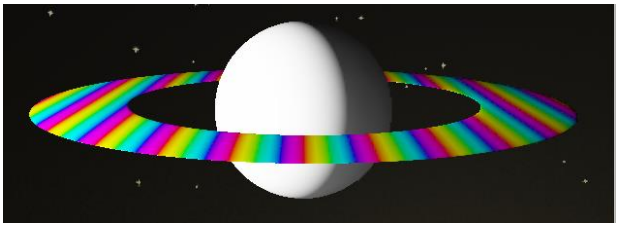


How about a metal material like gold? You can see the planet reflection on the gold rings.



How about a pattern like the Rainbow pattern from the **Light Gels** material group?

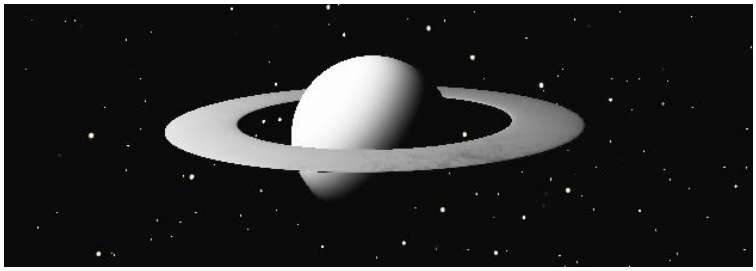
Seems that we need to have the patterns follow, or be applied in a circular pattern or function to look right.



Multiple Planet Rings

Another way of creating multiple concentric rings is to set up multiple torus's (tori?) similar to the ones above but each one having a different diameter and possibly, a different thickness.

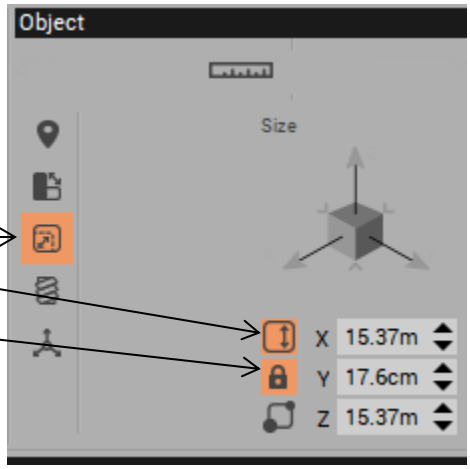
We begin, as each time before, with a **Flat white** default sized (6m) planet, tilted up into a **Physical Night** sky atmosphere with stars.



- As we did earlier, insert and orient a single torus as the first ring around the planet. Make its material Flat white.

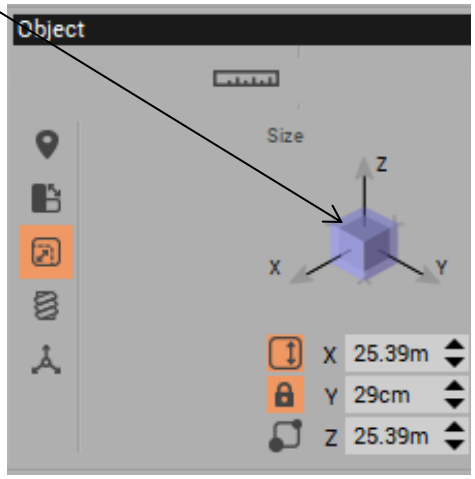
- Highlight the torus in the **World Browser** and make a copy of by right-clicking and selecting **Copy**, then again right-clicking the mouse in the World Browser and selected **Paste.**

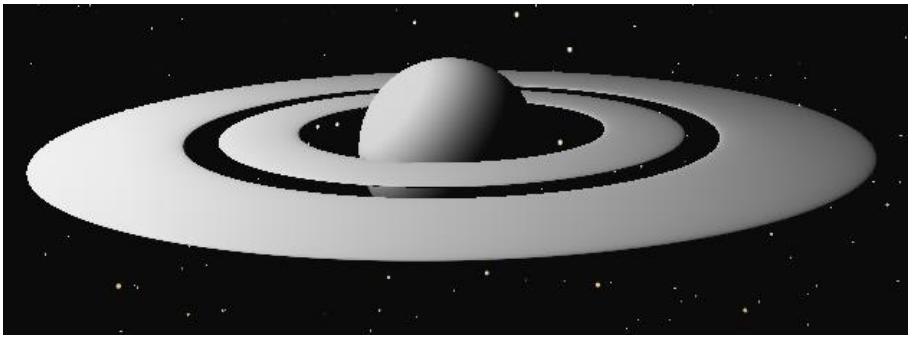
This torus will be an exact copy or the first torus in the exact same place. We will now resize it around the first torus.



- In the **Object - Size** panel, click the **Size** icon on.
- Click the **Display objects true dimensions** icon on.
- Click the **Lock sizing proportions** icon on.

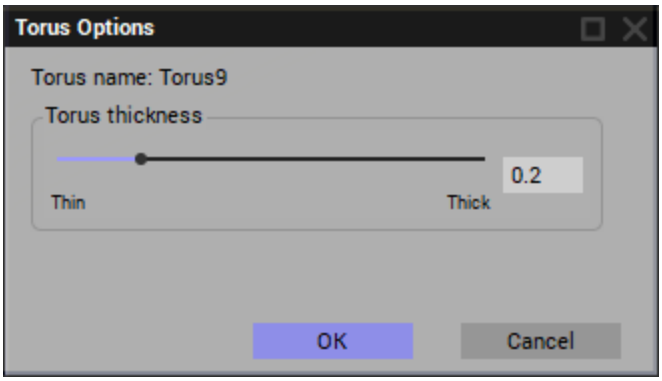
- Now place the mouse cursor on the **X-Y-Z Size** box until t turns lavender, then left-click and hold the mouse while moving it up to increase the size of the torus in-place or down to decrease its size.
- Release the mouse to set the size of the torus.





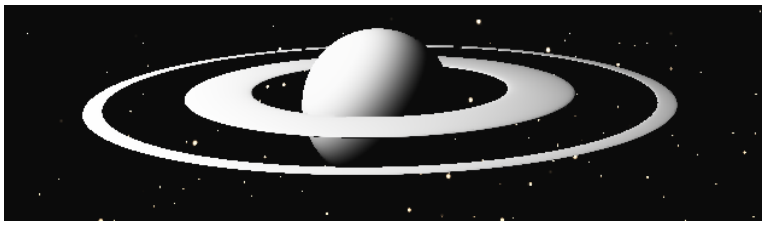
- In the World Browser, rename the first torus Inner Ring and the second torus; Outer Ring.

- Double-click the Outer ring in the World Browser to open the Torus Options window.

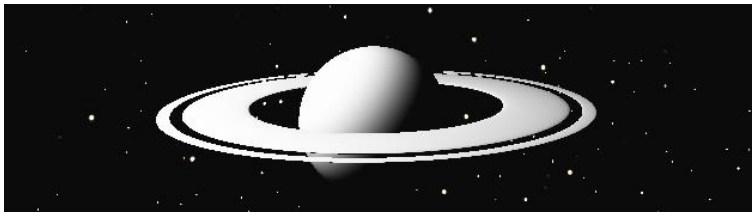


By default, the torus's thickness is 0.2 (inner diameter to outer diameter).

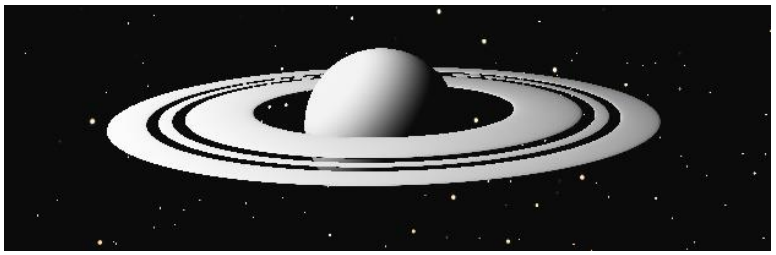
- Reduce the thickness to .03 and click OK.



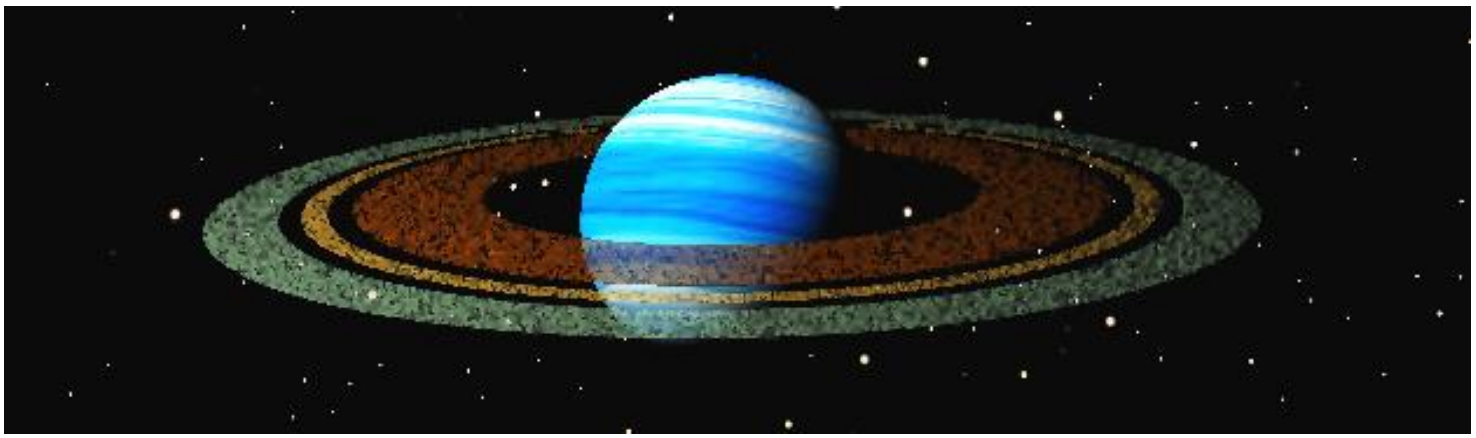
- Use the X-Y-Z Size box in the Object panel to reduce the overall diameter of the outer ring closer to the inner ring.



- Repeat this for a third planet ring



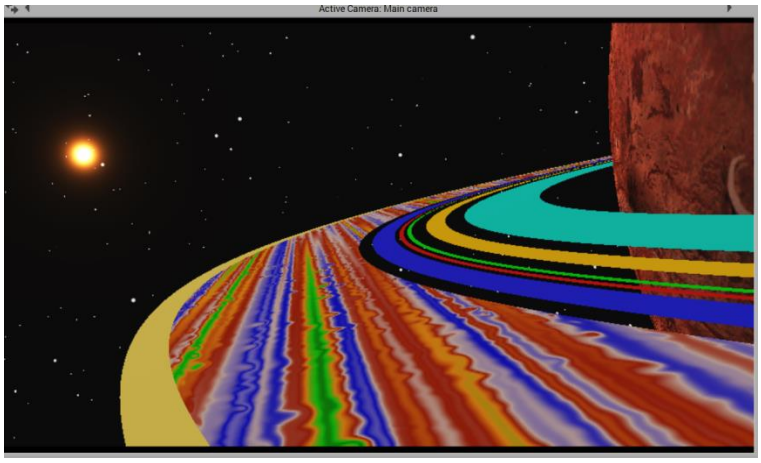
- Use various materials, scales, colours and transparencies to each of the rings to create the desired effect.



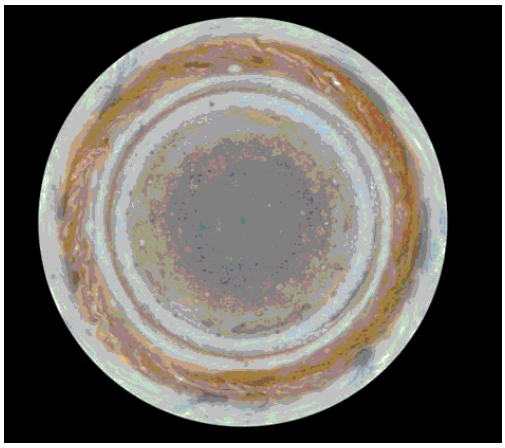
Using Circular-Mapped Pictures for Planet Rings

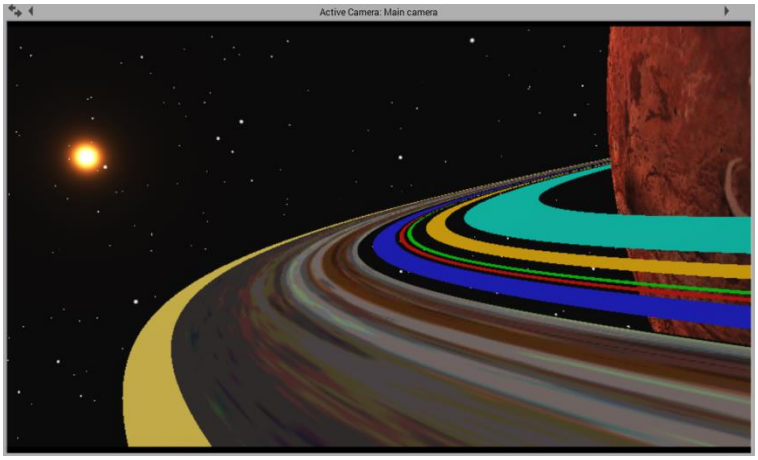
The above materials on the torus rings leave a bit to be desired. The most realistic ring appearance would be to have the variations in the ring colours that flow with the ring in a circular direction around the planet.

Any texture or bitmapped colouring of the ring is usually shown in an X-Y plane on the ring material:



What we want is to create a colour map in a perfectly circular radial form. Then any variations in the colours can become variations in the colour of the rings that the bitmap is applied to.





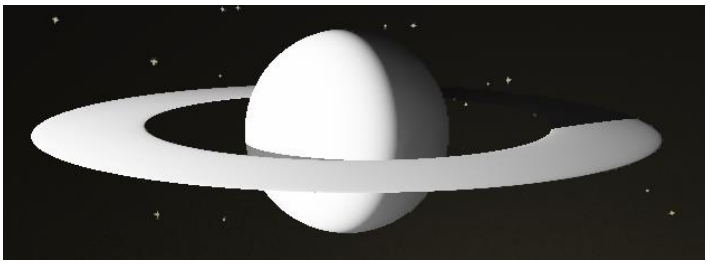
Creating Custom Circular Colour maps

There are (at least) two applications can be used to create a custom-colour circular maps that can be used for planet rings. These are Corel PaintShop and Adobe PhotoShop.

Etherealcanvas has a separate tutorial document on how to create custom ring colours using each of these applications.

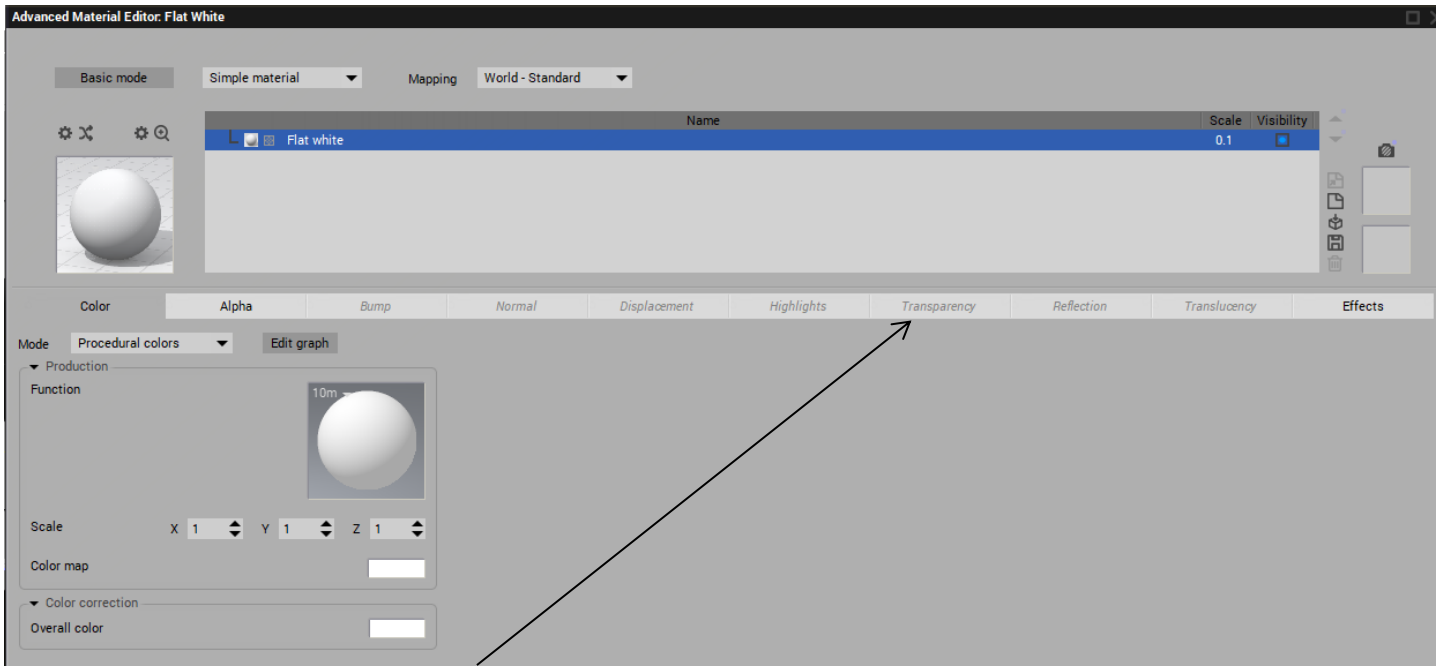
Using Ecosystems for Rings

Another way to make interesting rings is to use ecosystems to populate a transparent torus with various objects.

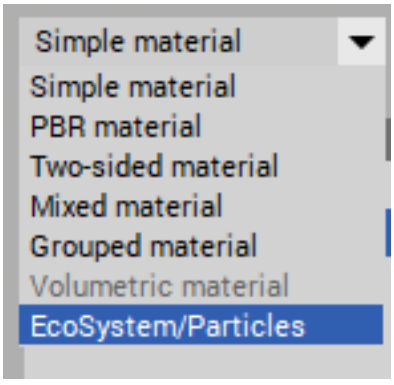


- First we'll set the ring material back to the basic flat white material that we used for the planet.

- Now, with the planet ring highlighted in the **World Browser**, double-click the material sphere in the **Object - Aspect** panel to open **the Advanced Material Editor:**

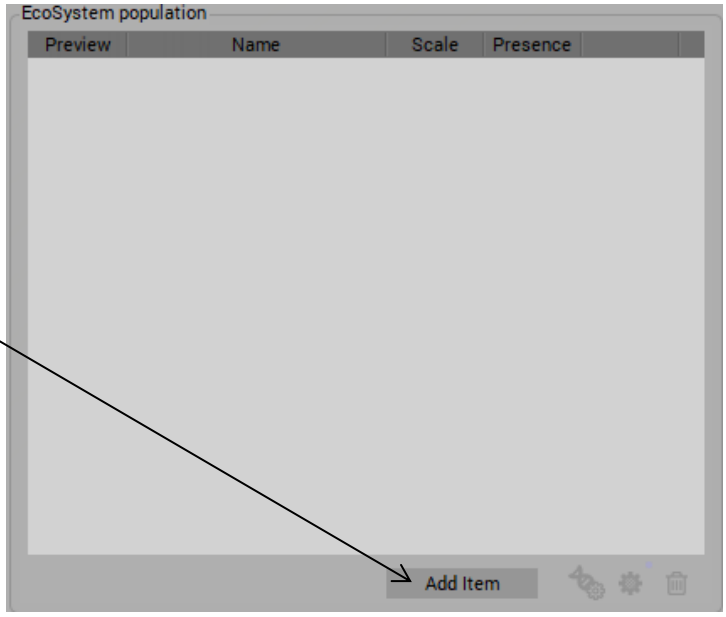


- Under the **Transparency** tab, set the **Global Transparency** to 0%. The planet ring will disappear. (but it's not gone)
- To the left of the material layers list, click on the **Add Layer** icon:  A new layer will appear in the list above the **Flat White** layer, called **New Layer**.
- Above the layer list a box shows this new layer to be a **Simple material**. Click the down-arrow to its right and select **Ecosystem/Particles** from the list to make the ring an ecosystem material.



The **Advanced Material Editor** will adjust its tab headings for the new type of material.

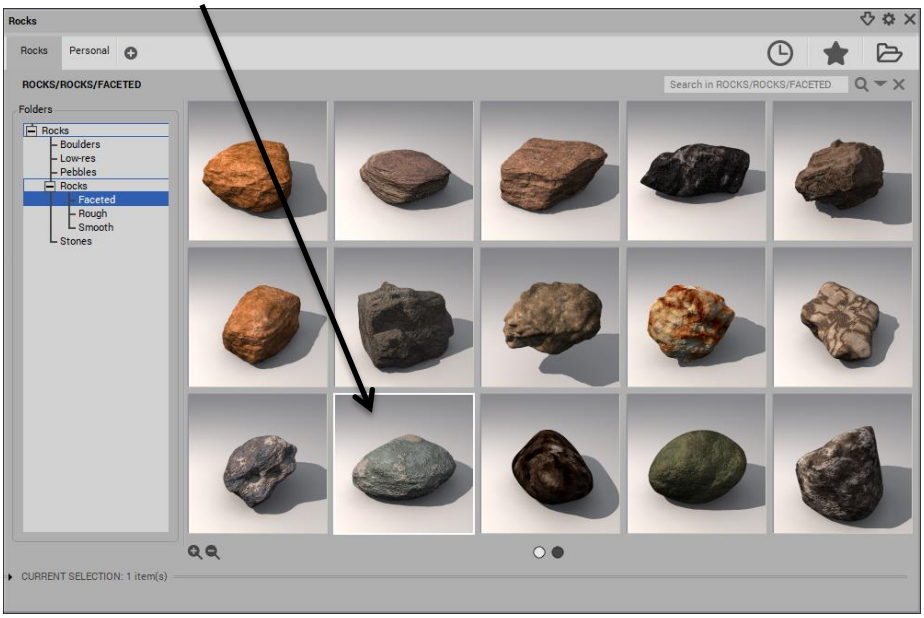
Population the Ring EcoSystem



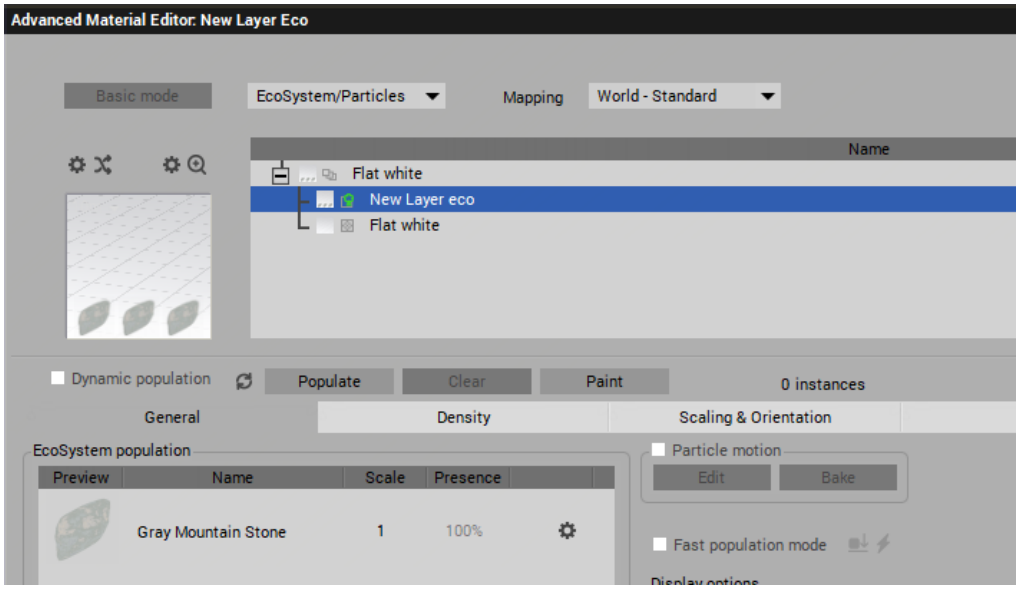
In the **General** tab you can see the **EcoSystem population** window.

At the bottom there is an **Add item button** (Vue Pro 2019 version)

- Click the button and select **Add Rock…** from the list to open the rock objects listing.
- Select the **Gray Mountain Stone** from the **Faceted** group of rock types.

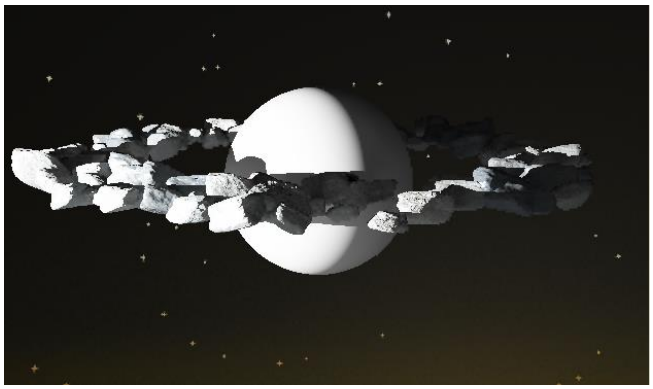


After a second or two to load, the selected rock will show in the **EcoSystem population** window.



- To get a preview of what this will look like, click the **Dynamic population** checkbox, above the **EcoSystem population** window, on.

- Now click on the **Preview** button to the right of the checkbox to see the ecosystem populated on the planet ring:

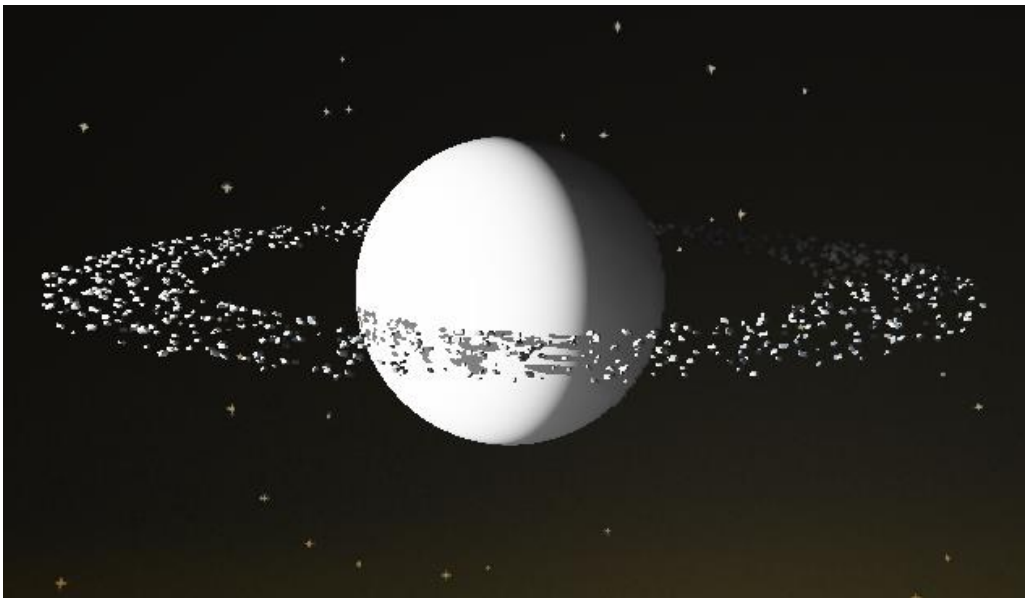


Oops. Well you can see that the rocks are nowhere near the right size for the planet. The planet was made from the default size of the sphere primitive we loaded earlier. Its size is actually only about 6 metres in diameter. So the rocks are way oversized.

- Uncheck the **Dynamic population** checkbox and click **OK** at the bottom to close the window and clear the populated rocks.
- Now double-click the (now invisible) material sphere in the **Object - Aspect** panel to open up **the Advanced Material Editor** again. The **Gray Mountain Stone** should still be shown in the **EcoSysytem population** window.

- First, change the **Scale** value of the **Gray Mountain Stone** to something much lower, try **.1**.
- Then click the **Density** tab and lower the **Overall density** of the population of the stone from 50% (default value) to about 3% to 5%.
- Now check the **Dynamic population** box on again and click the **Preview** button again.

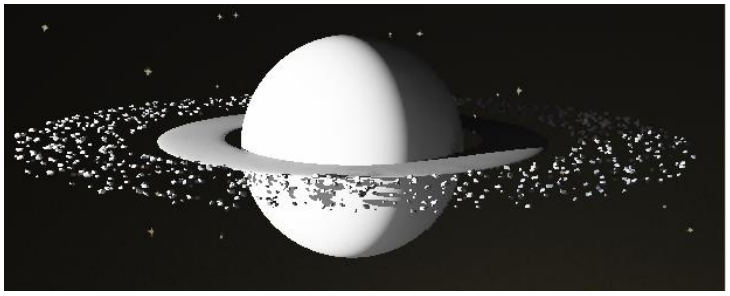
This is much closer to what we were looking for:



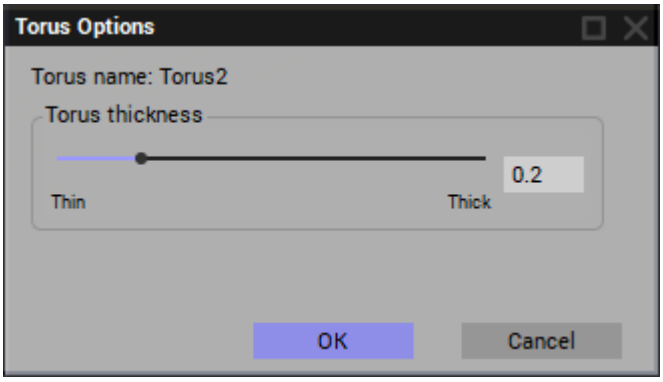
Adding a Second Planet Ring

This time we will add a second planet ring, much thinner in horizontal width than the first one.

- Once again, click on the Torus primitive on the left tool-bar.

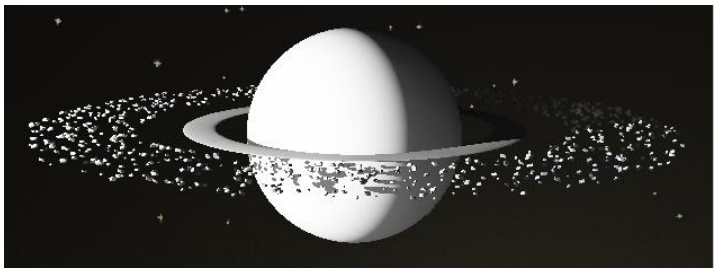


- Use the sizing and rotation grips to arrange and move the torus as we did with the first one but place it inside the first torus's diameter, between the planet and the outside ring.



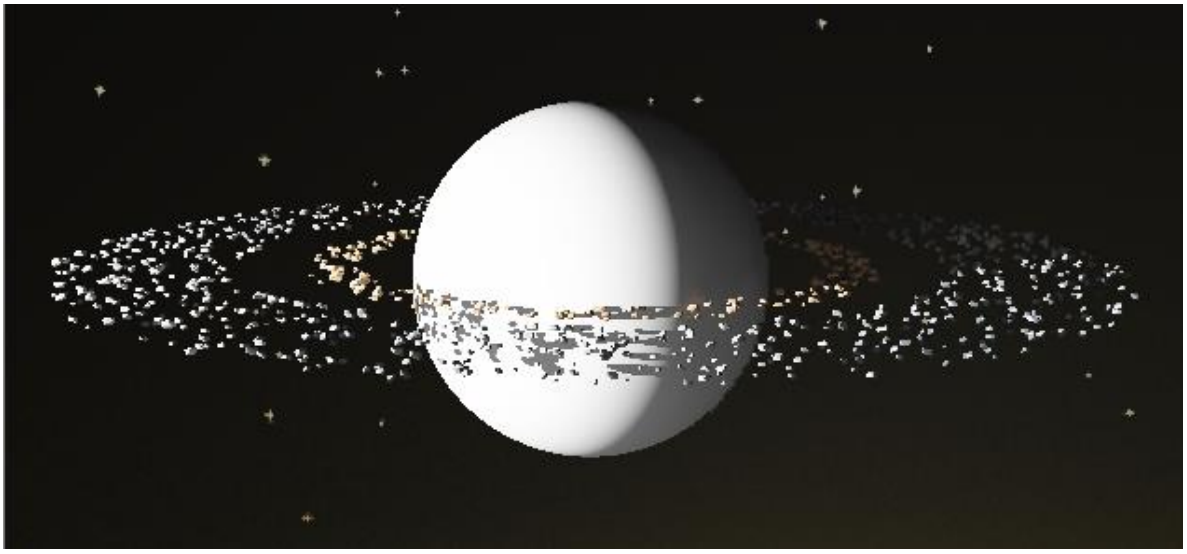
- Double-click the new torus in the **World browser**, or right-click it and select **Edit Object…** from the displayed list. In either case the **Torus Options** window will be displayed. It has only one adjustable parameter; the torus thickness. Its default value is .2. Reduce this to .1

The horizontal thickness across the ring's cross-section has been reduced. So the unidirectional Y direction grips change the ring's vertical dimension while the Torus thickness option changes its horizontal thickness.



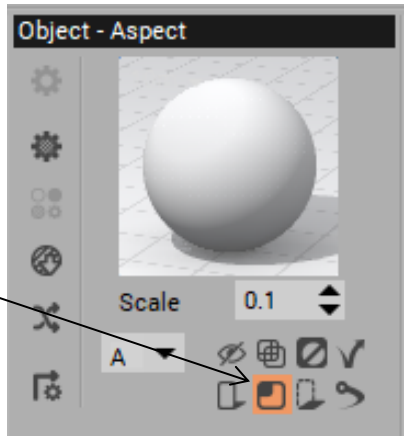
➢ We'll rename the rings in the **World Browser** as **Outer Ring** and **Inner Ring.**

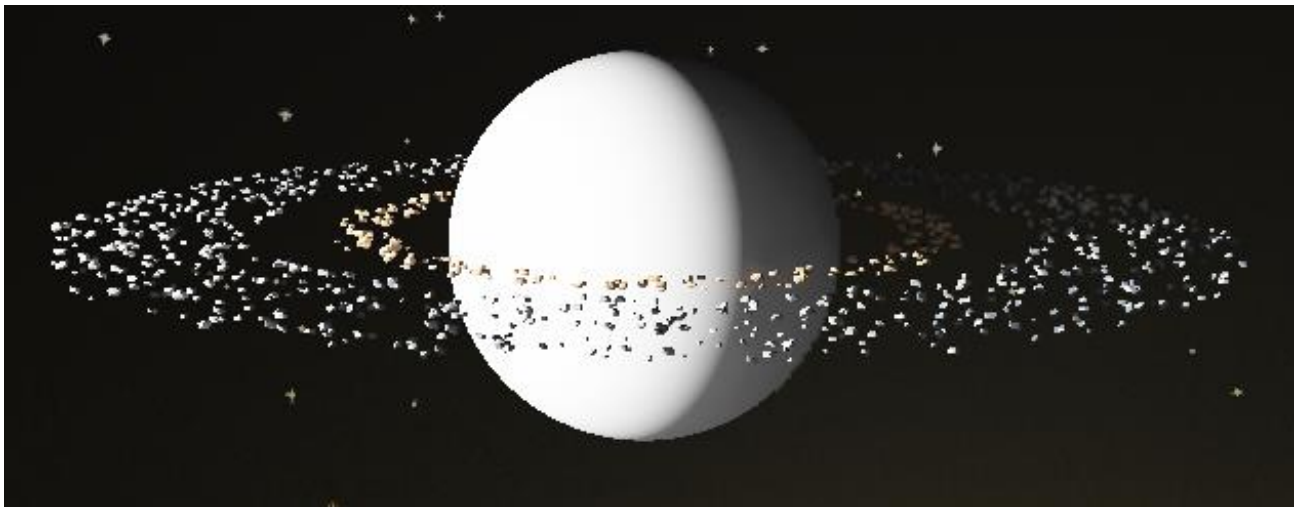
➢ Now, once again, we will populate the inner ring with ecosystem elements:
- change the inner ring material to **Basic - Flat white.**
- Open the ring's **Advanced Material Editor** (double-click in Object - Aspect)
- Under the **Transparency** tab change its **Global Transparency** to 100%
- Click the **Add layer** icon and change the **New layer** from a **Simple material** to **EcoSystem/Particles**
- Under the **General** tab, select **Add item** and pick the **Red Canyon Rock**
- Set the Scale of the Canyon Rock to .1 and set the population Density to 5%
- Check the **Dynamic population** box on and click the **Preview** button:



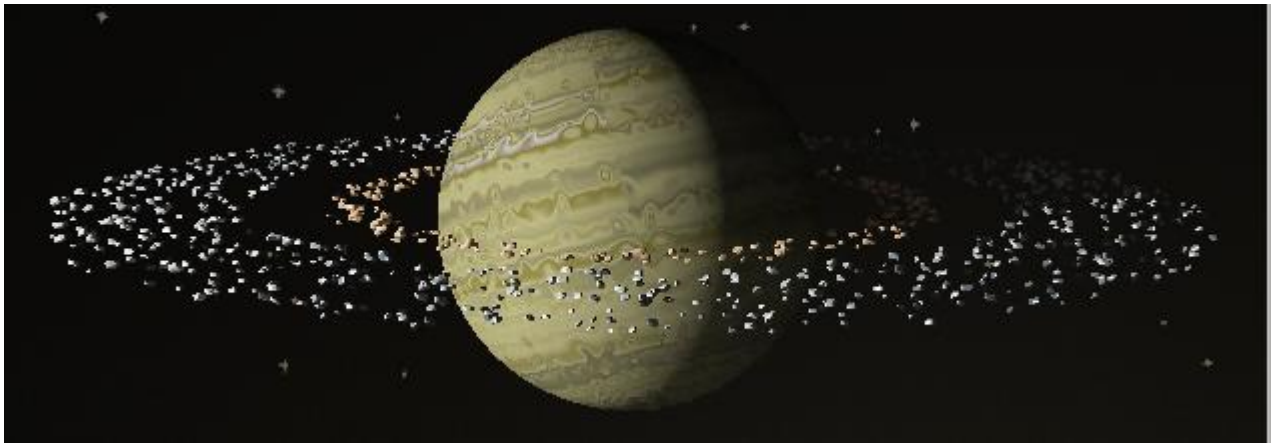
If you do not want the rocks of the rings to cast shadows onto the planet, highlight the planet in the **World Browser**.

In the **Object - Aspect** panel, click on the **Don't Receive Shadows** icon.





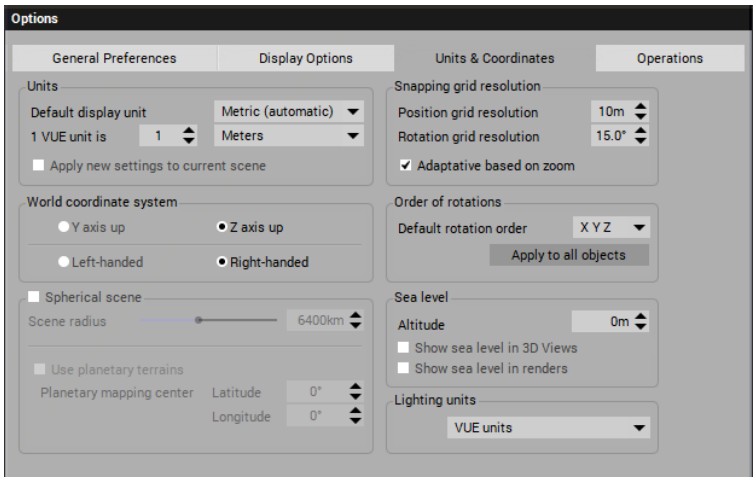
Use any method presented earlier to add colour and texture to the planet.



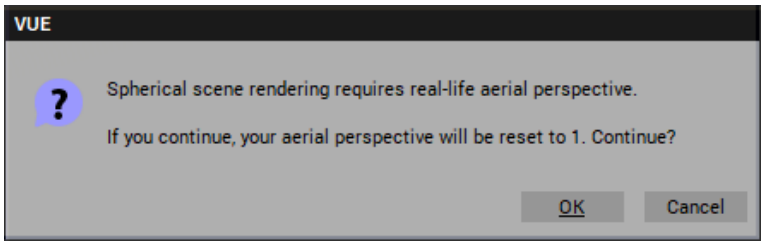
Planet Surfaces using Spherical Scenes

In this next section on Planet Creation, we take a closer look at the planet surface by using a Vue feature of spherical scenes and terrains.

- Begin by opening Vue to a new, empty scene.
- In the main menu, open **File/Options** and then select the **Units & Coordinates** tab.
- Select the **Spherical Scene** checkbox.



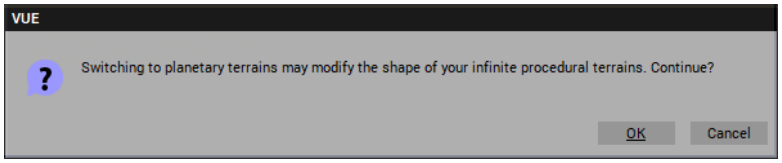
You will see a warning about the aerial perspective. Click **OK** to accept this.



- Finally, check the **Use Planetarty Terrains** checkbox.

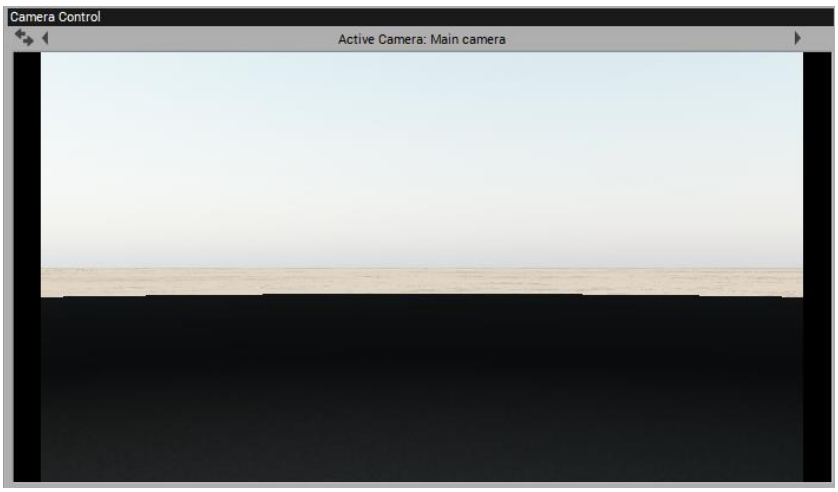
Again a message will be displayed warning that this may modify the shape of procedural terrains:

- Click on **OK** again to accept this.



- Then click **OK** in the **Options** display.

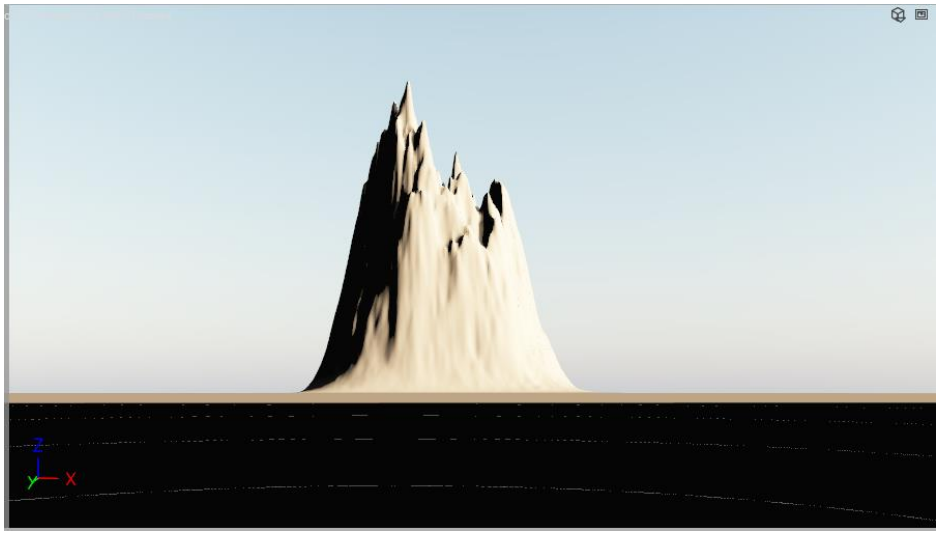
The main camera view will show a slight curature in the lower dark part of the screen:



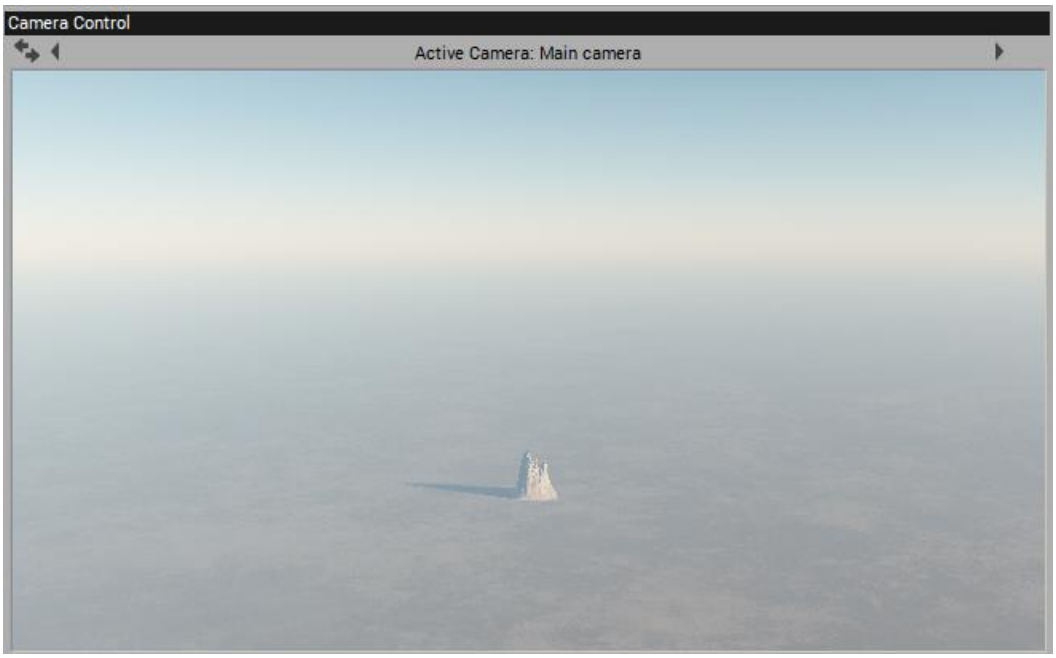
- Insert a Heightfield terrain. Then zoom outward to see the complete terrain in the camera view:

The default terrain size is 1Km square. We'll exagerate the terrain hieght considerably.

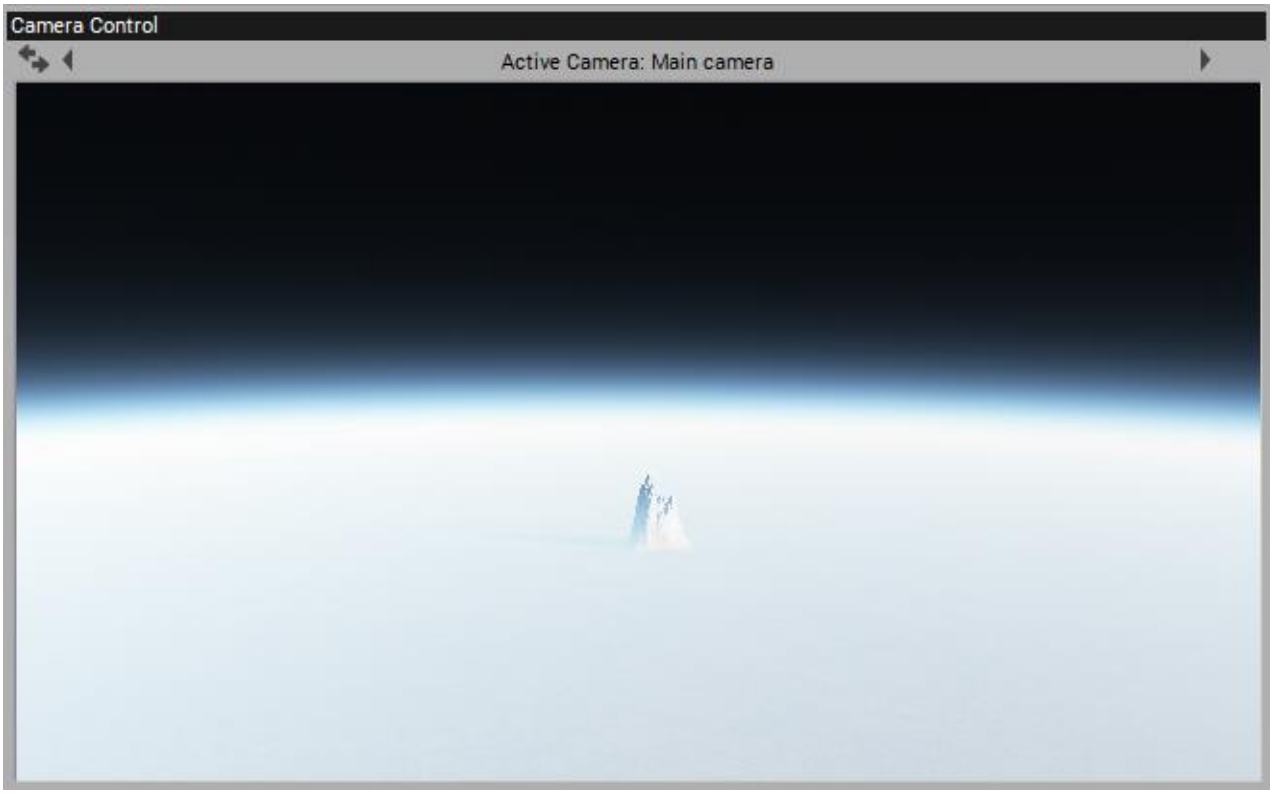
- Use the terrain X grips to lengthen the terrain height to abut twice its width. Zoom out to see it fully in the camera view:



- Select the terrain in the World Browser. Then using the Camera Control's **Orbit Around Selection** tool: tilt and zoom out from the terrain until the horizon and terrain are both in the main view.



- Continue to resize the terrain and zoom outward until a clear, black, outer space is shown and the small terrain (example size is now 20kmx20km) can be seen through the atmospheric haze:



To create an interesting aerial view of the planet surface, create new terrains or copy and modify existing terrains.

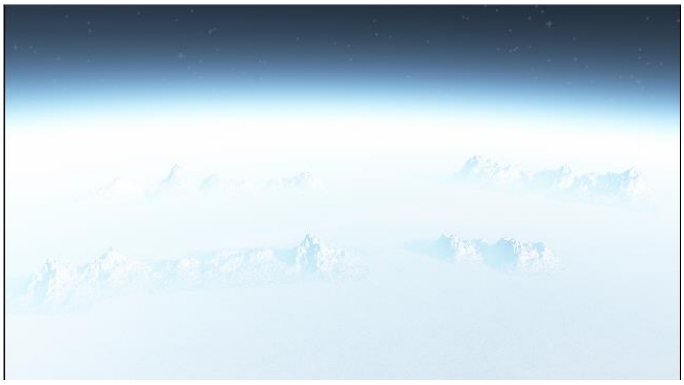
The terrains are now visible right to their base. We want to create a covering over the planet surface so that the peaks of the planets will be peaking through clouds.

- First highlight the ground in the World Browser and change its material to a Landscape, Grass & Rock material.
- For added effect, open the Atmosphere Editor and in the Effects tab, turn on the stars, set an amount and brightness as desired.

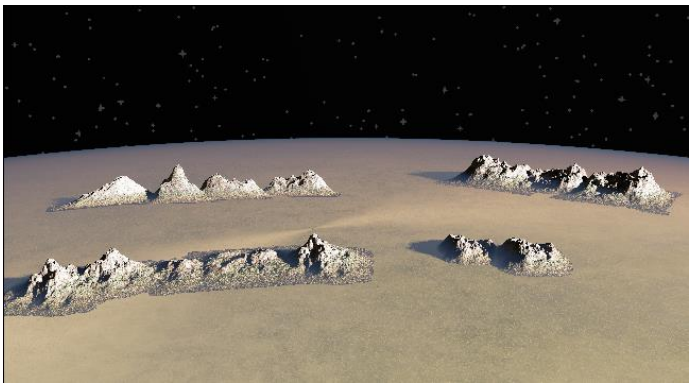
Most of the other parameters like light levels, cloud variation, fog and haze that will affect the planet surface come through the **Atmosphere Editor** as well.

Sky, Fog & Haze
Under the Sky, Fog & Haze tab of the Atmosphere Editor, of the greatest influencers of the glow of the light over the surface will be the **Sky mean altitude.**

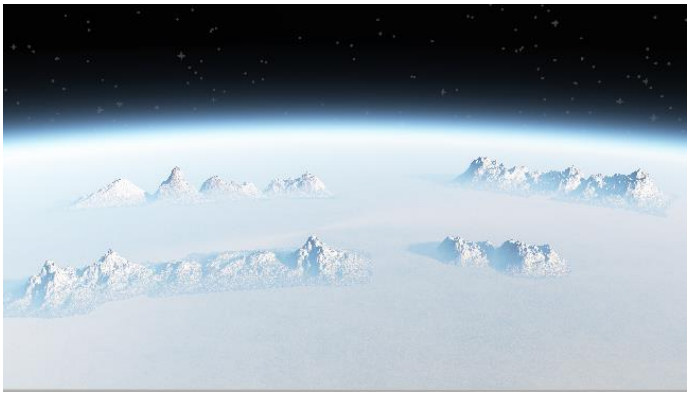
In the example mountain range above, the upper-most mountain peak is at an altitude of 30 Km. When the sky mean altitude is at 30 km the surface looks like this. There is so much sky colour influence in the scene that the mountain range almost disappears….



If the sky mean altitude is set to about 1km, the view is perfectly clear with only a hint of sky colour influencing the scene.

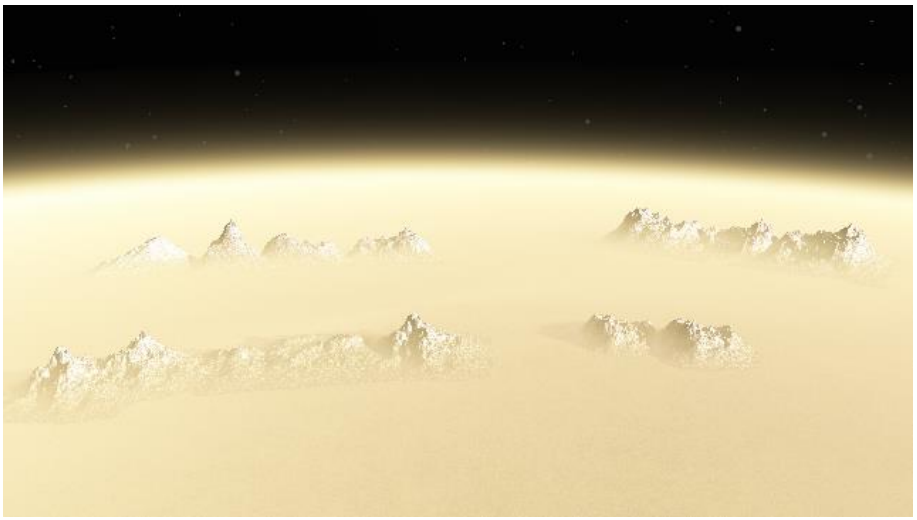


At a value of 15km the sky casts a pleasing glow over the horizon and colours, but doesn't overpower the view of the mountain ranges.



Sky Colour

Another parameter that has great influence over the planet surface view is the sky colour.



The default light blue colour is shown in the examples above. Again, in the **Sky, Fog & Haze** tab, clicking the **Sky color** box will allow the selection of a different sky colour:

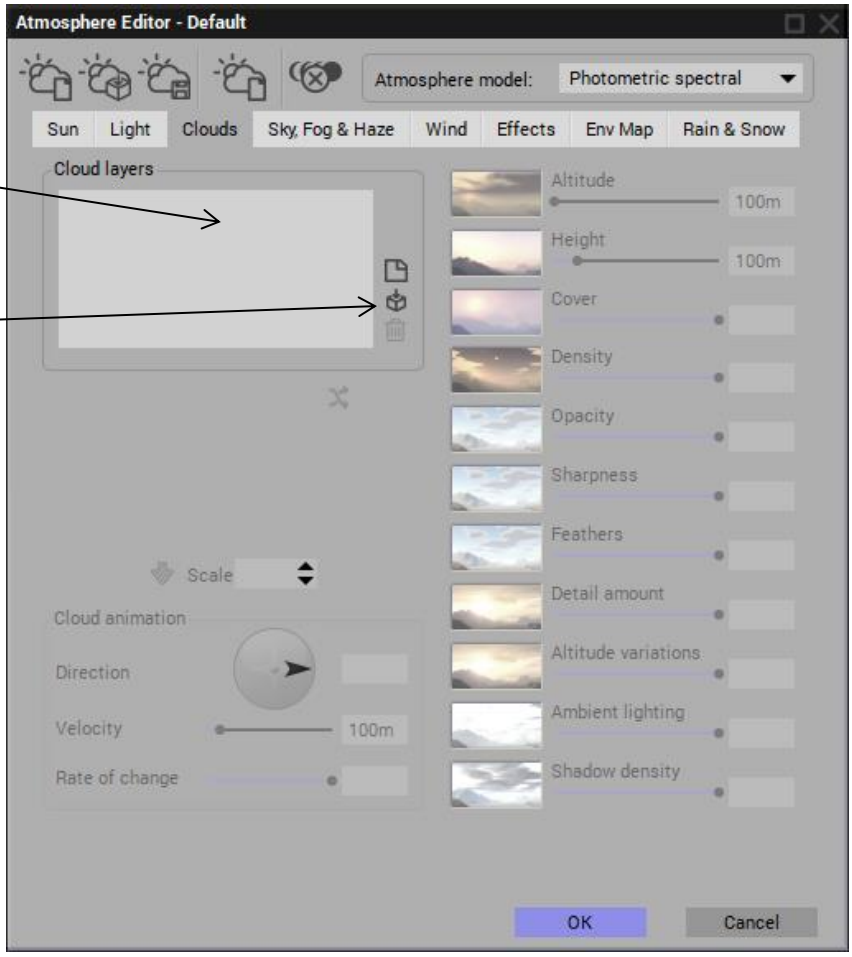
Clouds

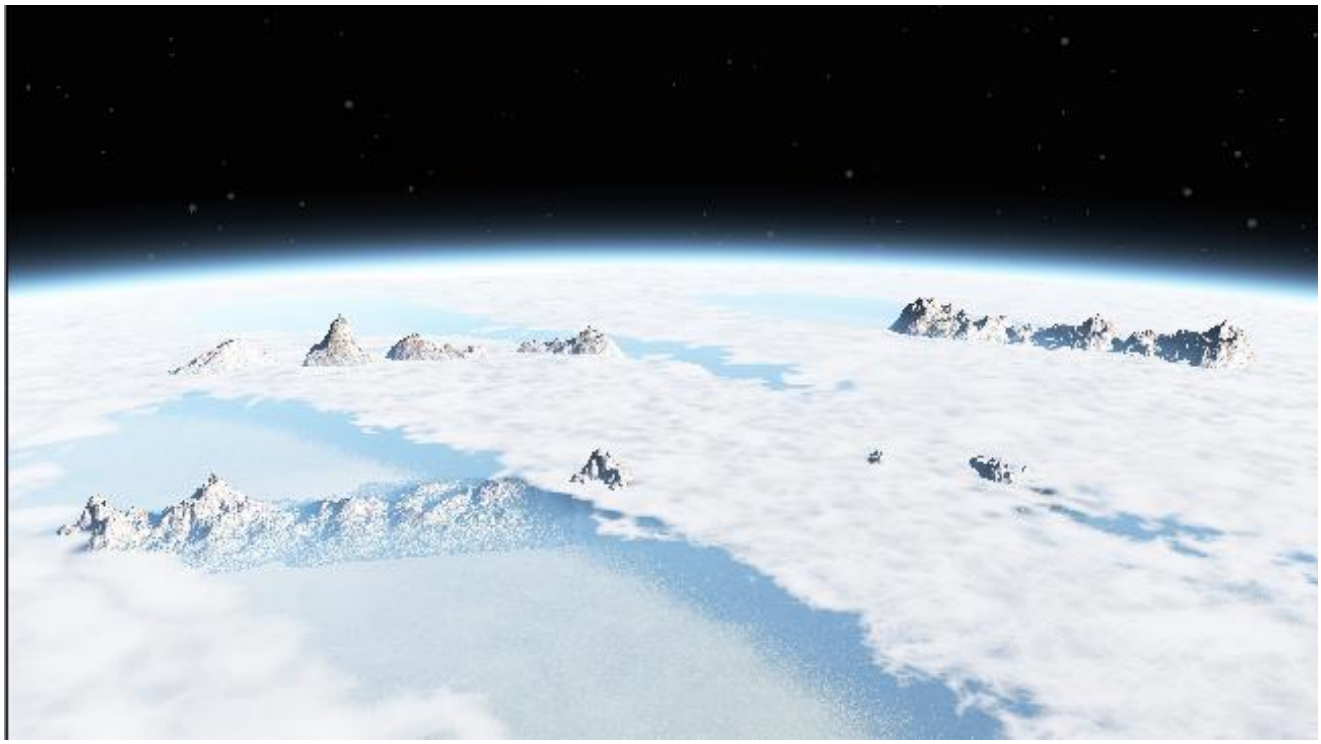
In the default empty scene that was loaded there are no clouds. In this scene we would like to have the mountain range poking through a layer of clouds. The clouds may completely cover the planet surface or cover just some of the mountains below their peaks.

- In the **Atmosphere Editor,** select the **Clouds** tab.

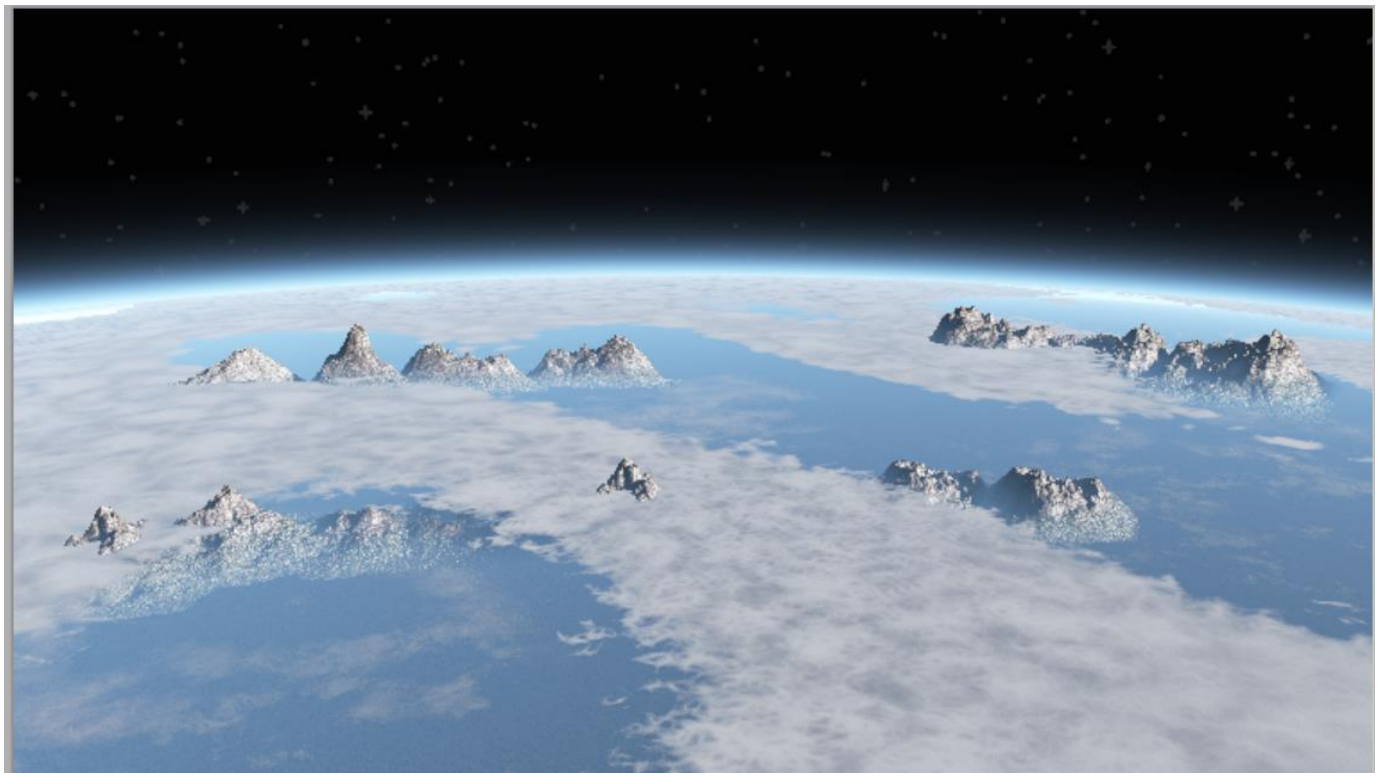
At this point there are no cloud layers listed in the layers window.

- Click on the **Load Cloud Layer** icon
- From the **Clouds2/Spectral** group of cloud types, select the **Large Cumulus2** clouds.
- Set the cloud **Scale** to 1
- Set the **Altitude** to 12km
- Leave the **Height** at 1km
- Set **Cover** to 60%
- Set **Density, Opacity, Detail, Ambient lighting** and **Shadow** density al to 100%
- Set **Altitude variations** to 100%
- Click **OK** to close the **Atmosphere Editor**





- **Density** and **Opacity** contribute to the whiteness of the clouds. Setting them lower will make the clouds appear whiter.
- Change the **Altitude** to raise the cloud bank to expose more or less of the mountain peaks.
- Change the **Cover** to cover the planet surface with more cloud.
- To change the direction and placement of the cloud banks, highlight the **Large Cumulus 2** clouds in the **World Browser** and use the gizmos or grips in the **Top view** to move and rotate the clouds.



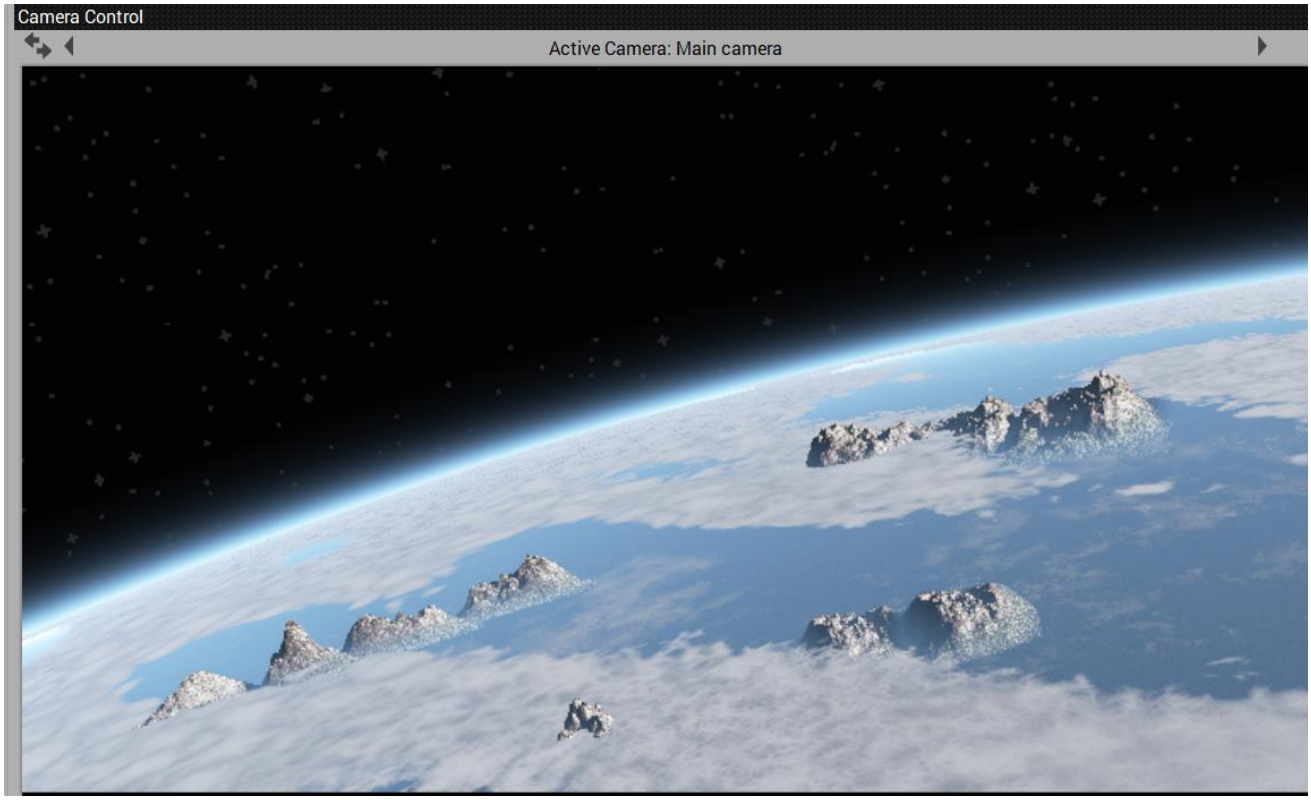
The above scene eventually became finished as “Jamison’s Peak”

Tilting the View

Normally the active camera will have a number of default attributes. These can be seen in the **Object-Aspect** when the Main Camera is selected:

The highlighted one:  is to keep the **camera level** at all times. This prevents the ability to rotate the camera away from perfectly level no matter where over the planet surface the camera may be.

- Click this **Always level camera** off to allow the camera to be rotated (usually in the Front View) and tilt the resulting image.



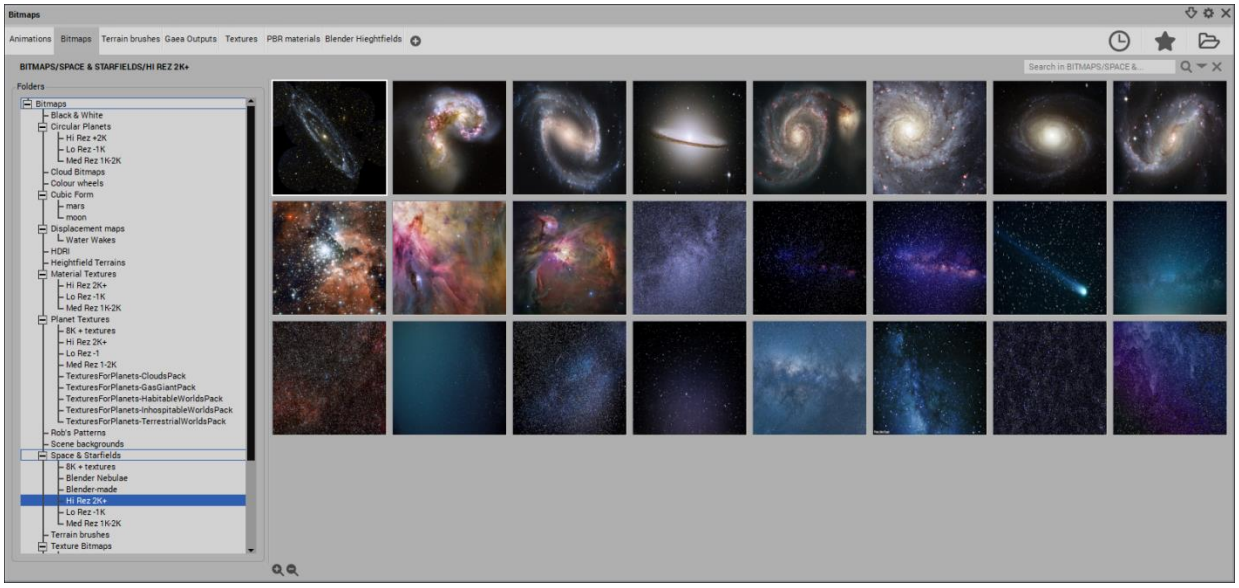
Using Images & Backdrop Planes for the open space
The outer (black) space area adjacent to the planet could be filled with stars by using the Effects tab of the Atmosphere Editor.

There are also so many images of deep space, either real or imagined, that are available from the web with a simple Google search. These could be ones taken by the Hubble telescope, found at:
https://www.nasa.gov/mission_pages/hubble/multimedia/index.html
or at https://www.space.com/34-image-day.html among many others.

To apply one of these images as the space backdrop we'll begin with adding a basic plane object.

- Add a **Plane** to the scene.  It will be among the geometric objects at the left toolbar. 
- Tilt and resize the plane to directly face the camera (in the Side View) and occupy a fair amount of the space area (in the Front View).
- Double click the material sphere in the **Object-Aspect** area to open the **Advanced Material Editor**.

- Change the **Mapping** at the top from the default **World – Standard** to **Object - Parametric**.
- Change the **Mode** from **Natural grain** to **Mapped picture**.
- In the **Production** section select the **Load Image** icon: and from the presented bitmap images, select one for the space image.



Whatever the resolution of the image may be, the image will fill the plane. Since most images have a black background, it will blend seamlessly with the space background around the planet surface.

- You can use the Rotation controls: and the Mirror controls: to adjust the orientation of the image. Click OK to close the Editor.

At high resolutions (ie: 4K) Vue takes a vast amount of memory to render the scene. This seems to be specifically on the **Ground** element, as the entire surface of the sphere is being calculated to create the ground element.

- In these cases it may be useful to delete the default **Ground** infinite plane item in the **World Browser**. This will speed up the render considerably.
- Instead of the **Ground** infinite plane, add a low height terrain in one or more places to act as the ground.

NOTE:
Be careful not to move a Ground terrain too far away from the camera. Terrains are flat and will not conform to the spherical shape of the planet. You will see the terrain corners sticking out beyond the skyline. Instead, use a number of smaller terrains or clip the terrain corners in the Terrain Editor.

Here the plane used for the backdrop image may need some Photoshop or PaintShop Pro correction to make the black, space colour constant.