Overview

This chapter presents a very short FX Composer 2.5 tutorial to quickly introduce you to several convenient and powerful new features. We highly recommend this tutorial, particularly if you have not worked with FX Composer 2 previously.

The NVIDIA Software Improvement Program

The first time you run a freshly installed FX Composer 2.5, you'll be prompted to join the NVIDIA Software Improvement Program (or SIP, which you can learn more about at http://developer.nvidia.com/object/SIP.html).

In summary, if you opt-in to the SIP, FX Composer will record which product features you're using, and we will use this information to make the product better. At no time is content of any kind (such as models/textures/shaders/scripts) sent to NVIDIA. We encourage you to opt-in, as you will be helping to guide future software improvements towards your usage scenarios.

The SIP also allows you to immediately send feedback to NVIDIA at any time by pressing F4. This will bring up an Instant Feedback dialog box where you can enter suggestions or bug reports.

Creating an Effect

Next, you'll see FX Composer's Start Page. This page gives you convenient access to several commonly-used commands and resources.
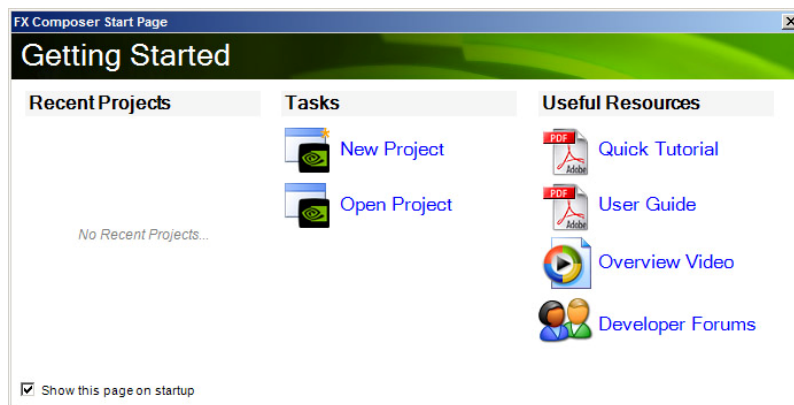
Let's start by creating a **New Project**. You should always try to organize your projects so that all key assets (models, shaders, and textures) are in the same folder. That way, you can easily ZIP up a folder to share your project with others.
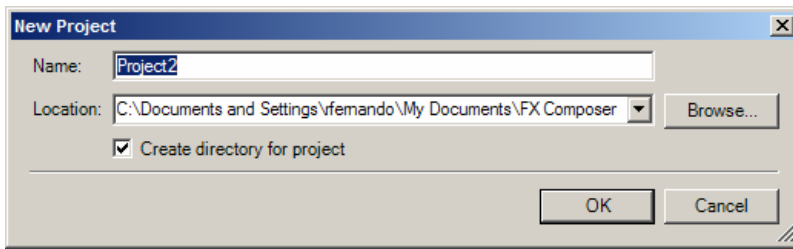
Name your project as you like, and choose a suitable location (the default location is My Documents/FX Composer 2). A subfolder with the project name will be created. Once the project is created, you'll see FX Composer's default layout.
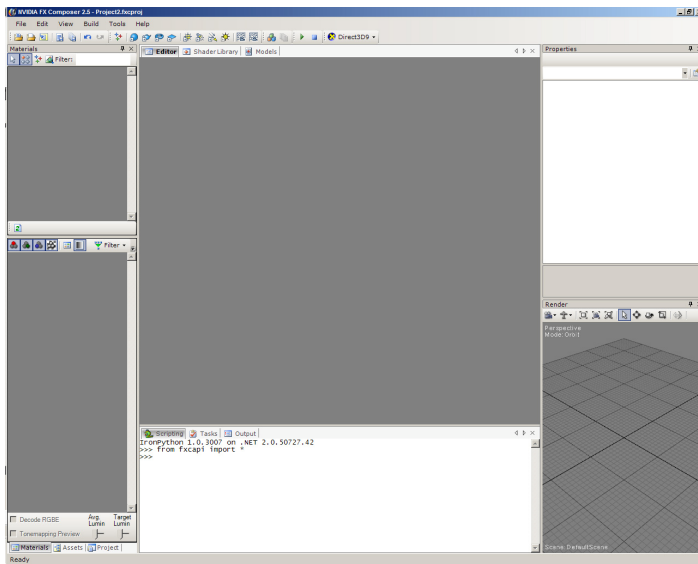
Let's create a new effect. Select the **New Effect** button on the main toolbar.

A short wizard will pop up, guiding you through the creation of your new effect.
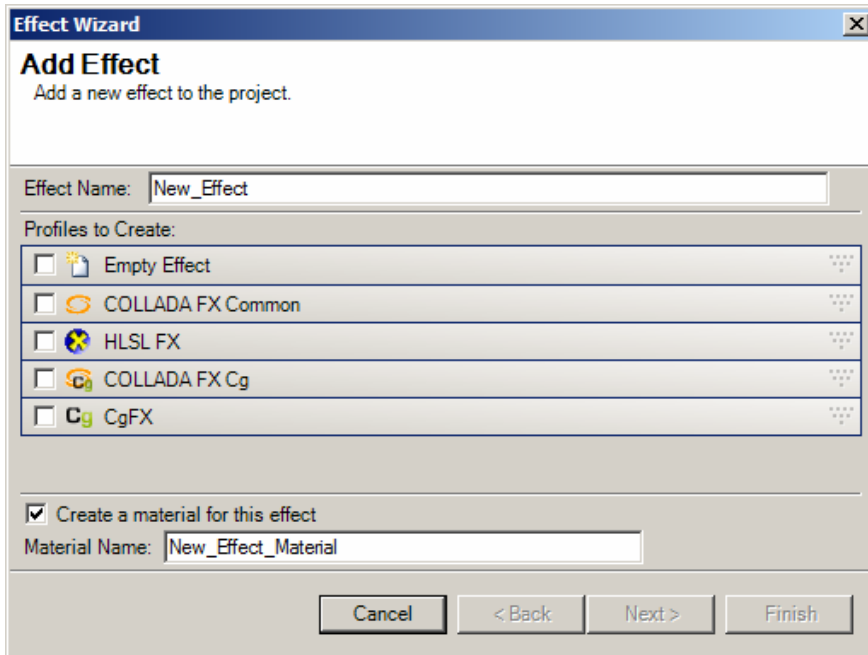
The wizard will prompt you for the types of shaders you want to add. Select HLSL FX and CgFX. Also, set the **Effect Name** as "Phong_Bump_Effect", and set the **Material Name** to "Phong_Bump_ Material".

You may be wondering what the difference is between a material and an effect. An "effect" is a shader—for example, marble. A "material" is an instance of an effect with specific properties settings—for example, green marble. Materials are what you actually apply to objects in your scene.

The advantage of having effects and materials is that you can modify the underlying shader code of several materials at once if they are based on the same effect, simply by modifying the effect. Without a materials system, you would have to create separate shaders for each material variant and modify all of these shaders individually to achieve the same result.

Click **Next**. You'll now get a chance to pick from a variety of shader templates for the .fx shader effect.
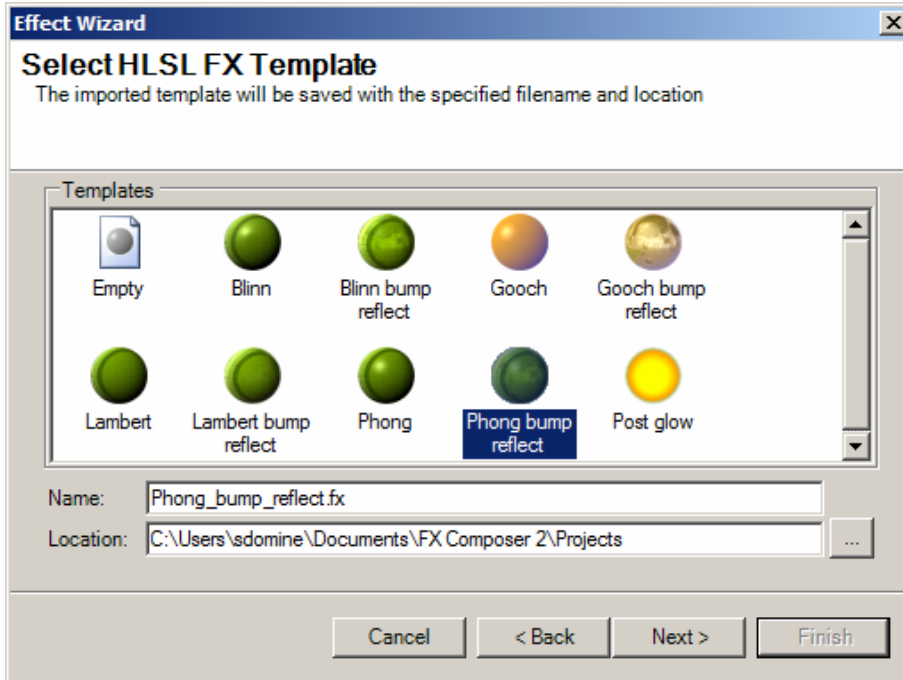
Choose **Phong Bump Reflect** and click **Next**. Then choose **Phong Bump Reflect** for the .cgfx file, and click **Finish**.

You'll now see a sphere in the Materials panel, shaded using your new effect.
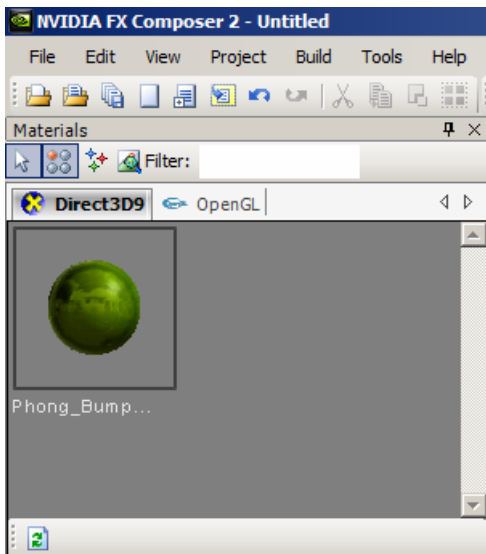
Importing Geometry

The next step is to create some geometry. On the main toolbar, click on **Import….** (This allows you to import geometry in various file formats, such as .fbx, .3ds, .obj, or .x.)

In the file dialog box, choose:
FX Composer 2/MEDIA/obj/tire.obj

You'll see an additional prompt about importing materials. Click **OK**.

You'll now see a black tire in the Render panel. Use **Alt + Leftmouse** in the Render panel to get a better vantage point by rotating the view. **Shift + Leftmouse** zooms in and out, and **Ctrl + Leftmouse** pans.

Let's also create a sphere by clicking on the **Create Sphere** icon on the upper toolbar. The sphere will appear at the world's origin, so it happens to fit conveniently inside the tire. Make sure the Render panel's **Direct3D** tab is active.
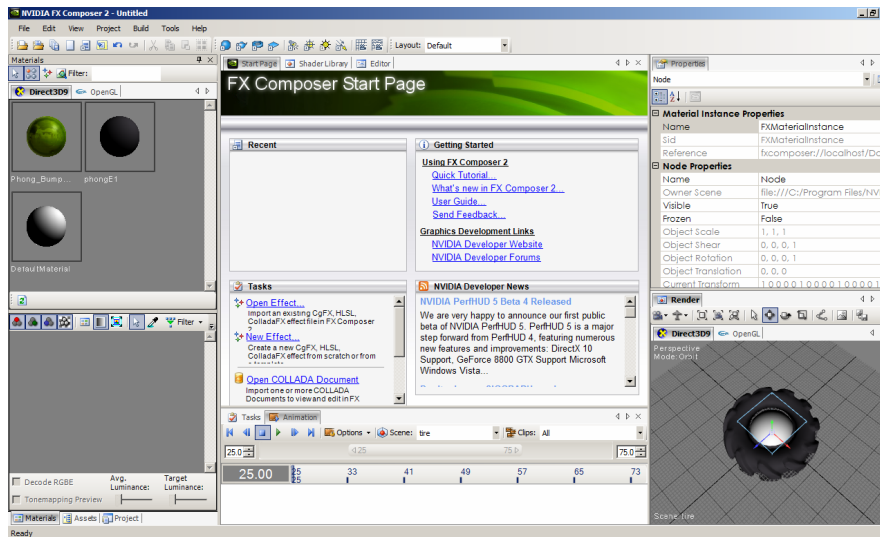

Applying Materials to Geometry

Now it's time to apply our material to our geometry. To do this, simply drag-and-drop the **Phong Bump Reflect material sphere** from the **Materials panel** onto the tire, and then repeat the process for the sphere.
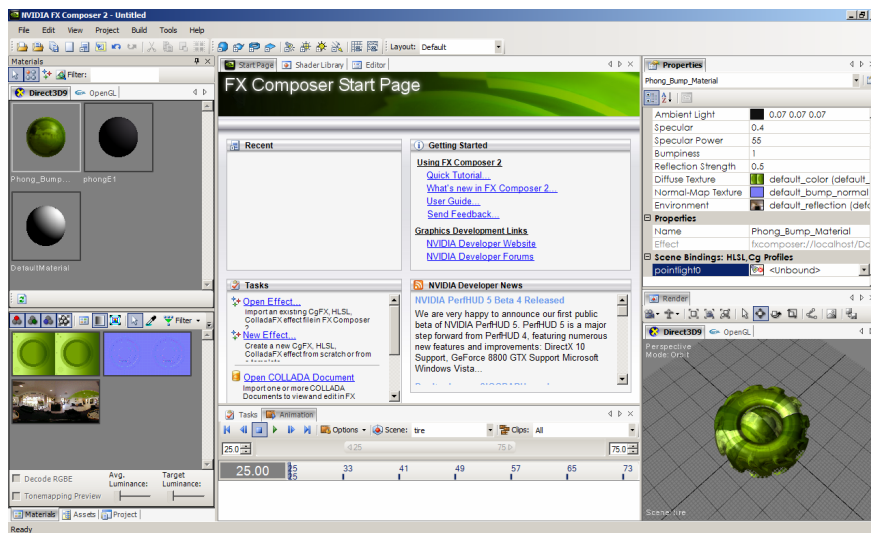
Modifying Material Parameters

Click on the **Phong Bump Reflect** material sphere in the Materials panel. This will show the material's properties in the Properties panel.

Scroll down in the **Properties panel** until you see the **Specular Power** parameter. Click on its value and change it to 7 either by using a slider or by typing in the value directly. You should see the **Render panel** updating dynamically as you change the parameter.
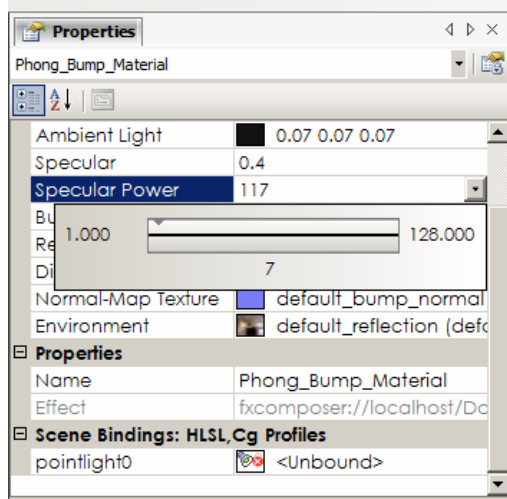
Do the same for the **Ambient Light** parameter. This is a color, so you'll use FX Composer's HDR color picker to pick a new color. In the color picker, dragging sliders with the left mouse button will change their base (mantissa) values. Dragging slides with the right mouse button changes their exponent. Make sure to use the left mouse button and drag the brightness slider (to the right of the color gamut) upwards. Again, the **Render panel** will show all your changes applied to the scene in real-time.
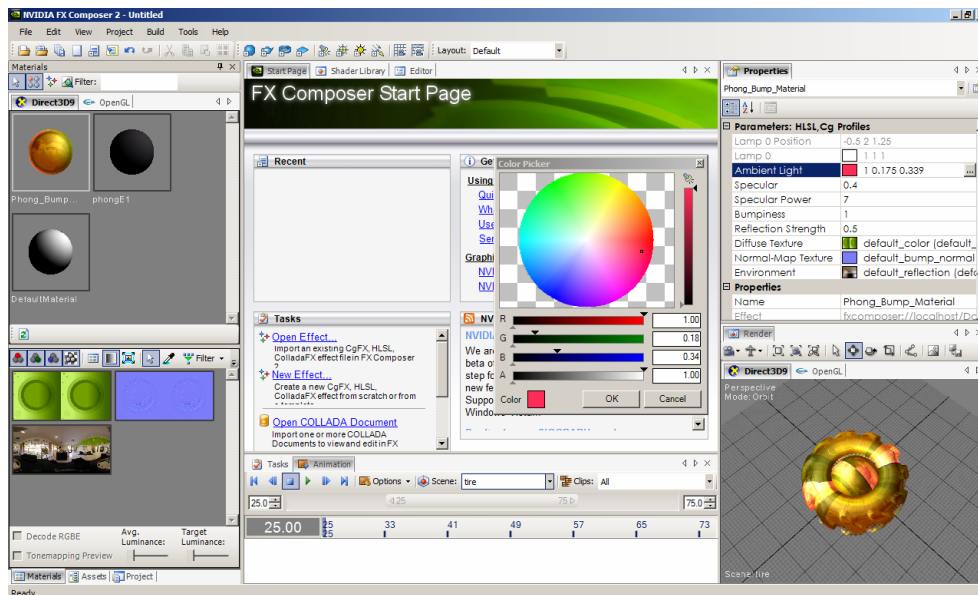
Assigning Textures

If you look through the list of parameters in the **Properties panel**, you'll notice several textures: Diffuse Texture, Normal-Map Texture, and Environment. Let's change the diffuse texture.

FX Composer has a **Textures panel** specifically for working with 2D, 3D, and cube map textures. View that panel by selecting **Textures** from the **View** menu.

Now click on the Texture Panel's toolbar's button ⊕ to add new images. It is worth noting that you can also drag and drop image files from Windows Explorer directly into the Texture Panel).
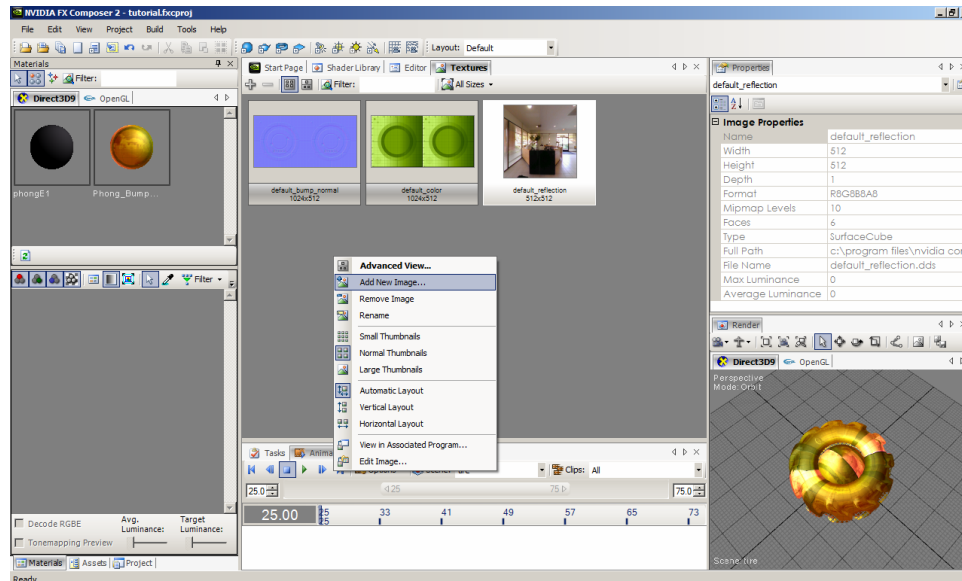

In the file dialog box, choose:
FX Composer 2/MEDIA/textures/2D/rockwall.jpg

You'll now see **rockwall.jpg** in the list of textures. Double-click on your texture to see detailed information about it.

Drag-and-drop the **rockwall.jpg** texture thumbnail onto the tire. You'll now be prompted for which of the Phong Bump Reflect material's textures to replace. Choose **Diffuse Texture**. Note that both the tire and the sphere change because they use the same material.
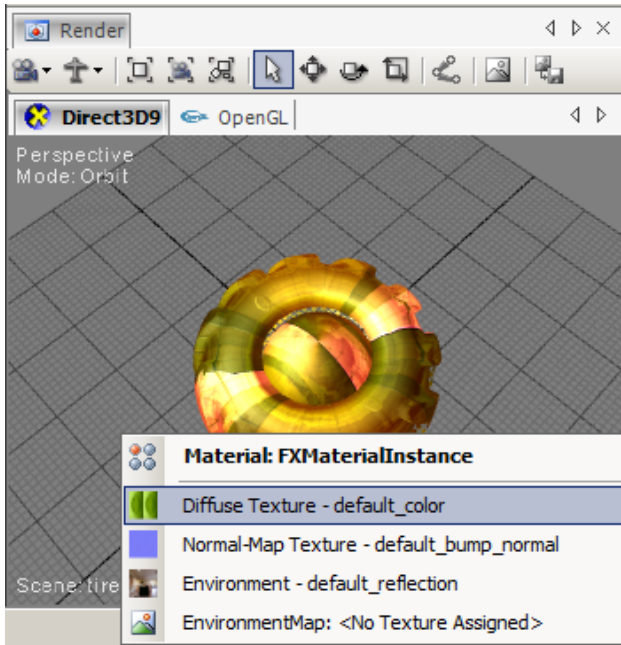
Binding a Light to a Material

Now let's bind a light to your material. This means that when you move the light, you'll see the material's shading change. (Where there are no lights in the scene, FX Composer searches through your material for the first light object it can find, and it uses the default positions specified there.)

Click on the **Add Spotlight** button ⚘ on the main toolbar to add a spotlight to your scene. The spotlight is created at the world origin, so it's obscured by the sphere.

Click on the **Translate Object** icon ✛ in the Render panel. Now you'll see a set of axes at the origin for the light. Clicking and dragging on any individual axis will allow you to move the light along just that axis. For free movement, click on the grey circle at the intersection of the axes.

Move the light to a reasonable location above the tire and sphere.

Now click on the **Select Object** icon ↖ in the Render panel. Click on the light to select it. Click-and-drag the light onto the tire. This will automatically bind the light to the tire's material. (If a material has several light inputs, you will be prompted for which one to use.)

Your light is now bound to the material. If you switch to **Translate Object** ✛ again and move the light around, you'll see the lighting on the tire respond to the light position. (But notice that the sphere, which isn't bound to the light, doesn't change its appearance as the light moves.)

Shader Library

The NVIDIA Shader Library, which is tightly integrated with FX Composer, offers a vast collection of great shaders for both inspiration and extension. You can drag-and-drop shaders from the Shader Library onto objects in your scene.
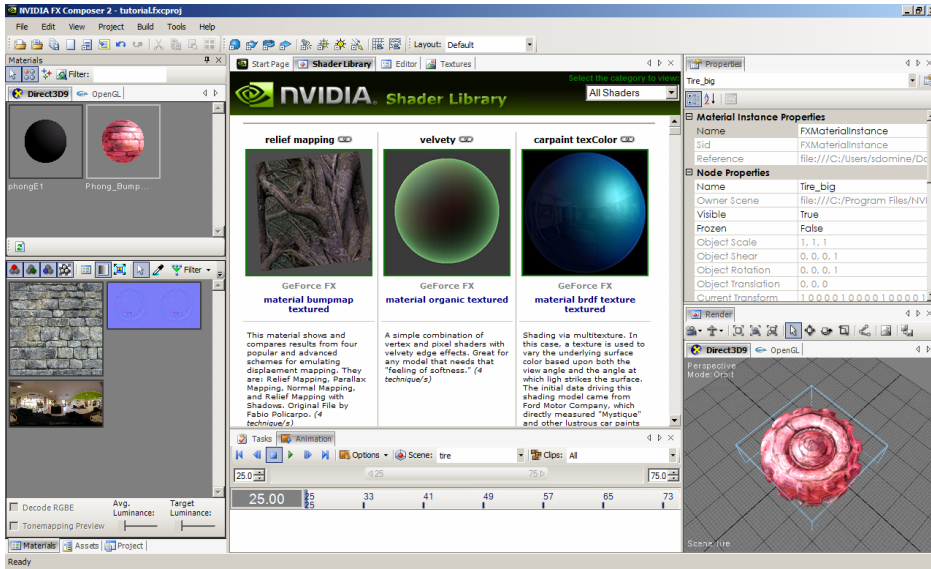
To do this:

Click on the **Shader Library** tab in FX Composer's central panel. Click-and-drag "velvety" onto the tire. (Optionally, you can re-associate the light with the tire by dragging-and-dropping it again.)
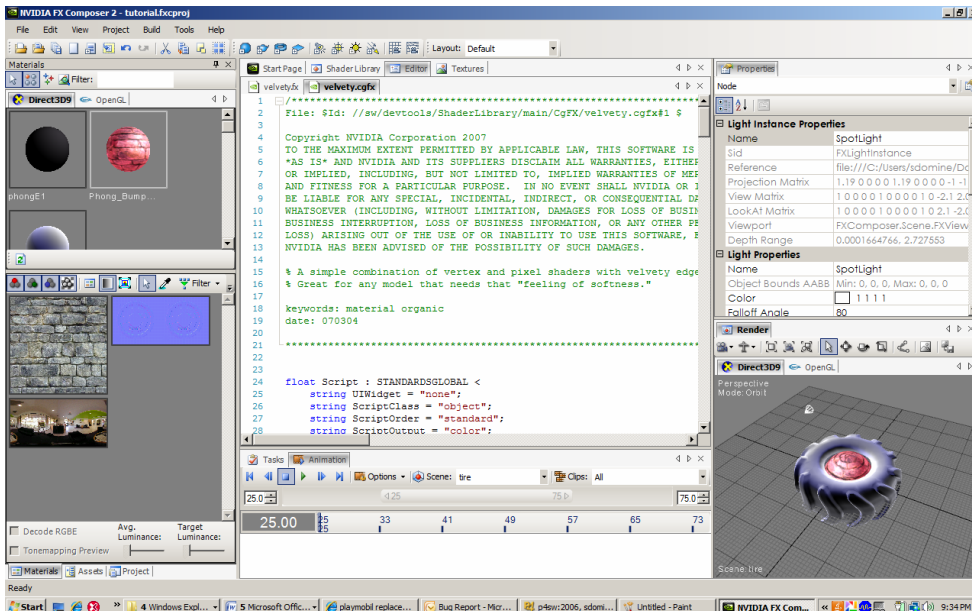
Editing Shaders

You can quickly access a material or effect shader source code by double-clicking on it in the Material Panel (or choosing "Edit" from the right-click context menu).

At this point though, you have noticed that dragging-and-dropping velvety.fx from the Shader Library onto the scene has automatically opened velvety.fx in FX Composer's editor. (You can change this default behavior via the **Settings...** option of the Tools menu.)

Press **Ctrl+F** and search for the word "result".

Let's modify the shader by changing the result expression to:

```
half3 result = diffContrib – specContrib;
```

Press **Ctrl+F7** to recompile the shader. The Render panel will update to reflect the new shader as well.