

The logo features the AMD logo (a stylized 'A' with a square) in white, followed by 'RADEON PRO' in a smaller, spaced-out white font, and 'Software' in a large, white, sans-serif font. The background is a dark blue, abstract, leaf-like pattern.

AMD
RADEON PRO
Software

AMD Radeon ProRender plug-in for Maya

User Guide

This document is a user and setup guide with tips and tricks on how to render photorealistic images in real-time, set materials and lighting.

DISCLAIMER

The information contained herein is for informational purposes only and is subject to change without notice. While every precaution has been taken in the preparation of this document, it may contain technical inaccuracies, omissions, and typographical errors, and AMD is under no obligation to update or otherwise correct this information. Advanced Micro Devices, Inc. makes no representations or warranties with respect to the accuracy or completeness of the contents of this document, and assumes no liability of any kind, including the implied warranties of non-infringement, merchantability or fitness for particular purposes, with respect to the operation or use of AMD hardware, software or other products described herein. No license, including implied or arising by estoppel, to any intellectual property rights is granted by this document. Terms and limitations applicable to the purchase or use of AMD's products are as set forth in a signed agreement between the parties or in AMD's Standard Terms and Conditions of Sale.

©2018 Advanced Micro Devices, Inc. All rights reserved. AMD, the AMD arrow, AMD FirePro, AMD Radeon Pro, AMD Radeon ProRender and combinations thereof are trademarks of Advanced Micro Devices, Inc. in the United States and/or other jurisdictions. Autodesk, the Autodesk logo, and Maya are registered trademarks or trademarks of Autodesk, Inc., and/or its subsidiaries and/or affiliates in the USA and/or other countries. Other names are for informational purposes only and may be trademarks of their respective owners. OpenCL and the OpenCL logo are trademarks of Apple Inc. used by permission by Khronos. macOS and Metal are registered trademarks of Apple Inc. Linux is the registered trademark of Linus Torvalds in the United States and other countries.

Table of Contents

What's New in AMD Radeon ProRender plug-in for Maya v2.4	2
What's New in AMD Radeon ProRender plug-in for Maya v2.3	3
Supported Platforms for v2.4.....	4
Software.....	4
Operating System.....	4
Supported Platforms for v2.1.20.14.....	4
Software.....	4
Operating System.....	4
Join the Discussion	4
Install the AMD Radeon ProRender plug-in	6
AMD Radeon ProRender for Microsoft Windows.....	6
AMD Radeon ProRender for macOS	9
Switching to AMD Radeon ProRender	12
Overview of User Interface	17
Render Settings	17
Render Viewports	18
Animation cache	19
Clear Cache.....	19
Viewport Mode	19
AMD Radeon ProRender Settings.....	20
Render Resources.....	20
Completion Criteria	20
Texture Compression.....	20
Globals.....	21
Global Illumination	23
Quality Presets.....	23
Sampling.....	23
Filtering	23
Trace Depth	24
Render Stamp	24
Environment	25
Image Based Lighting	25
Sun and Sky.....	27

Ground	35
Tone Mapping	36
Linear	36
Photolinear.....	37
Reinhard02	37
White-balance.....	37
Motion Blur	38
Render Passes (AOV)	38
Working with Lights	40
Initial Lighting of a Scene	40
Emissive Material Lights	40
Portals	44
Working with Cameras	46
Default.....	46
Spherical Panorama	47
Spherical Panorama Stereo	48
Cube Map	49
Cube Map Stereo	49
Depth of Field	50
VR Cameras.....	51
Working with Materials	52
Display the Material Library	52
AMD Radeon ProRender Material Library	54
AMD Radeon ProRender Material Browser	55
Assigning Basic Materials.....	57
Using Maya Materials	62
Saving	63
Diagnostics and Trace Files	64

OVERVIEW

AMD Radeon™ ProRender is a free un-biased rendering plug-in for your visualization needs in Autodesk® Maya®. Using physically accurate path-tracing technology, AMD Radeon ProRender can produce stunning photorealistic images of your scene and provides real-time interactive rendering and continuous effects adjustments to help create the perfect rendered image. The AMD Radeon ProRender plug-in is fully integrated into Maya – it supports the Maya lights, materials, and textures and renders your geometry accurately. AMD Radeon ProRender also comes with a library of materials to get you started.

This user guide will describe how to use and set up the AMD Radeon ProRender plug-in for Maya.

What's New in AMD Radeon ProRender plug-in for Maya v2.4

- Added support for macOS® Mojave 10.14.0+
- Added checkbox to use Metal native raytracing API to render settings.
- Updated Uber shaders:
 - Diffuse backscattering option, allows simple backlighting for objects like tree leaves or semi-translucent film.
 - Clearcoat thickness and transmission color. Allows simulating effects like a lacquer on a surface, allowing the artist to specify how thick the coating is, and if the coating has a color to the substrate, for example a yellowish tint to a varnish on furniture.
 - Refraction absorption, for glass and liquid objects that scatter light, for example deep water or glass with particles in it.
 - Per lobe normals. Artists can specify a normal map for each lobe, for example in car paint, a different normal map can be used for just the clearcoat to simulate micro scratches from waxing the surface, while the underlying material has a smoother normal map.
 - Refractions (Glass) Now default to not allow caustics, this will lead to faster, less noisy images as caustics are not computed unless necessary. For materials that the user does want caustics for, simply enable the checkbox in the refraction section of Uber.
- Reorganization of render settings, allowing clearer user control of render settings.
 - Different device configurations for viewport and final renders.
 - Set number of CPU threads for CPU renders (additionally remove a limitation of 32 threads to support Threadripper™ systems).
 - Control ray depth separately for diffuse, shadow, reflections and refraction.
- An ambient occlusion node is added for various uses. This is helpful for simulating "dirt" on a material or any time a material is wished to be blended or changed based in concave sections of geometry. Set this to use the front side to blend on the crevices, or back for pointed parts.
- Better support for instanced objects.
- Exporting of geometry and materials to the renderer has been refactored and optimized.
- Added support for ignoring selected objects when rendering.
- Invisible objects are no longer exported to the renderer as a performance optimization.
- The place texture node now works with AMD Radeon ProRender materials.
- Camera Motion Blur is now added.

What's New in AMD Radeon ProRender plug-in for Maya v2.3

- Support for macOS® High Sierra 10.13.3+ using *Metal*® 2. eGPU devices requires macOS® High Sierra 10.13.4.
- PBR Shader and Denoiser added in the render settings.
- An additional control for setting camera exposure to allow adding more motion blur is added.
- Texture gamma settings are now handled correctly.
- Physically based lighting controls greatly improve lighting setups.
- Additional area light shapes include: Rectangle, Disk, Cylinder, and Spheres.
- Light color can be set by temperature, color, texture, or all three.
- Intensity can be set additionally with physical units.
- Maya Remap HSV and Gamma Correct nodes are supported.

Supported Platforms for v2.4

AMD Radeon ProRender for Maya v2.4 runs on both GPUs and CPUS. OpenCL™ 1.2 is required for GPUs.

Software

- Autodesk® Maya® 2018
- Autodesk® Maya® 2017
- Autodesk® Maya® 2016.5
- Autodesk® Maya® 2016 with Service Pack 2

Operating System

- Microsoft Windows® 10 (64-bit)
- Microsoft Windows® 8.1 (64-bit)
- Microsoft Windows® 7 (64-bit)
- macOS® High Sierra 10.13.3+
- macOS® Mojave 10.14.0+

Supported Platforms for v2.1.20.14

AMD Radeon ProRender for Maya v2.1.20.14 runs on both GPUs and CPUS. OpenCL™ 1.2 is required for GPUs.

Software

- Autodesk® Maya® 2017
- Autodesk® Maya® 2016

Operating System

- CentOS 7.2
- CentOS 6.5

	CentOS 7.2	CentOS 6.5
Autodesk® Maya® 2017	✓	✓
Autodesk® Maya® 2016		✓

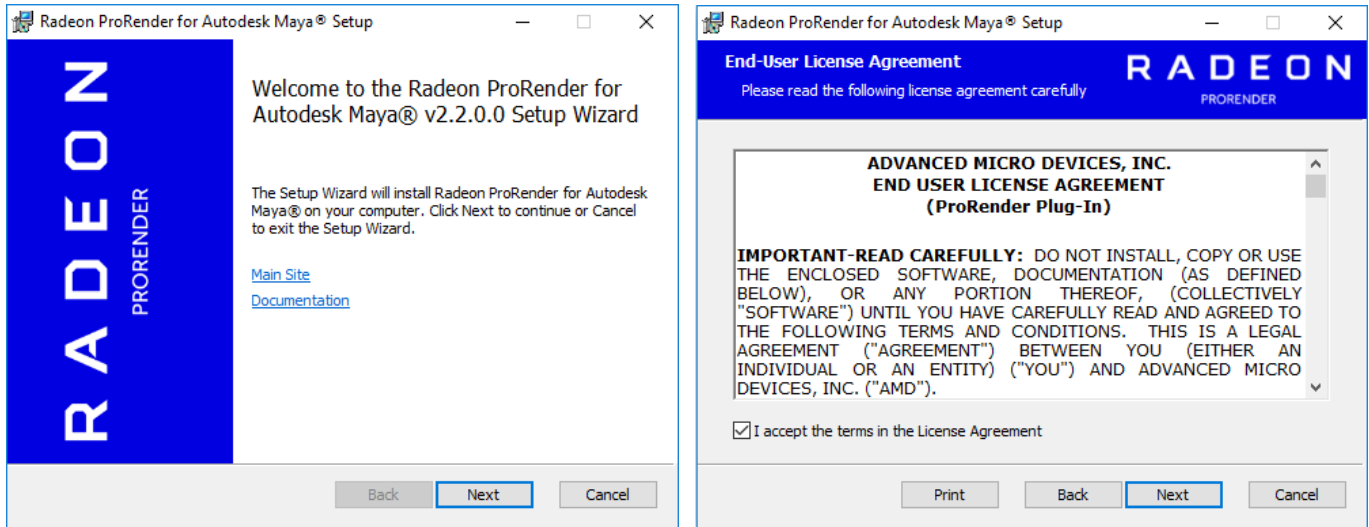
Join the Discussion

Provide feedback [here](#) for all AMD Radeon ProRender plug-ins.

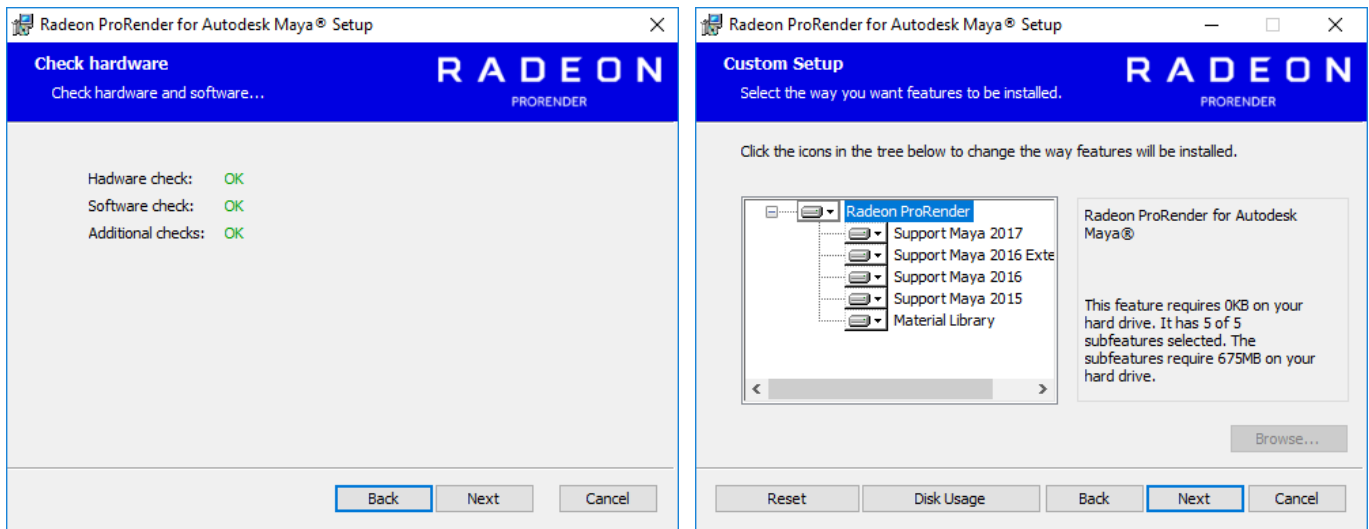
Install the AMD Radeon ProRender plug-in

AMD Radeon ProRender for Microsoft Windows

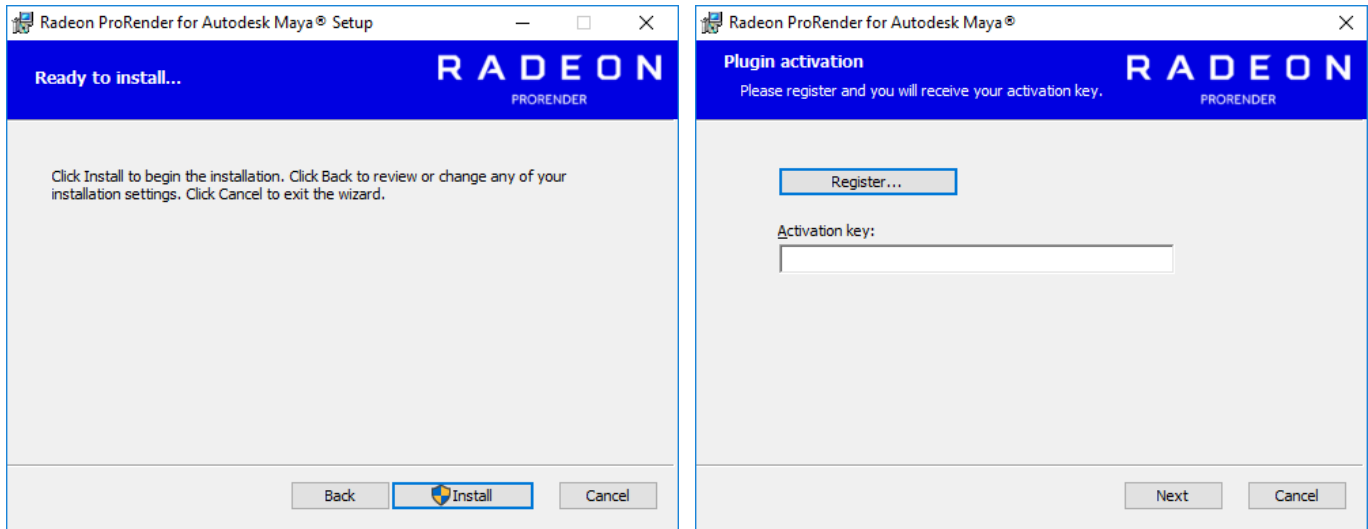
Download the AMD Radeon ProRender plug-in for Maya for Microsoft Windows®, launch the installer and agree to the license.



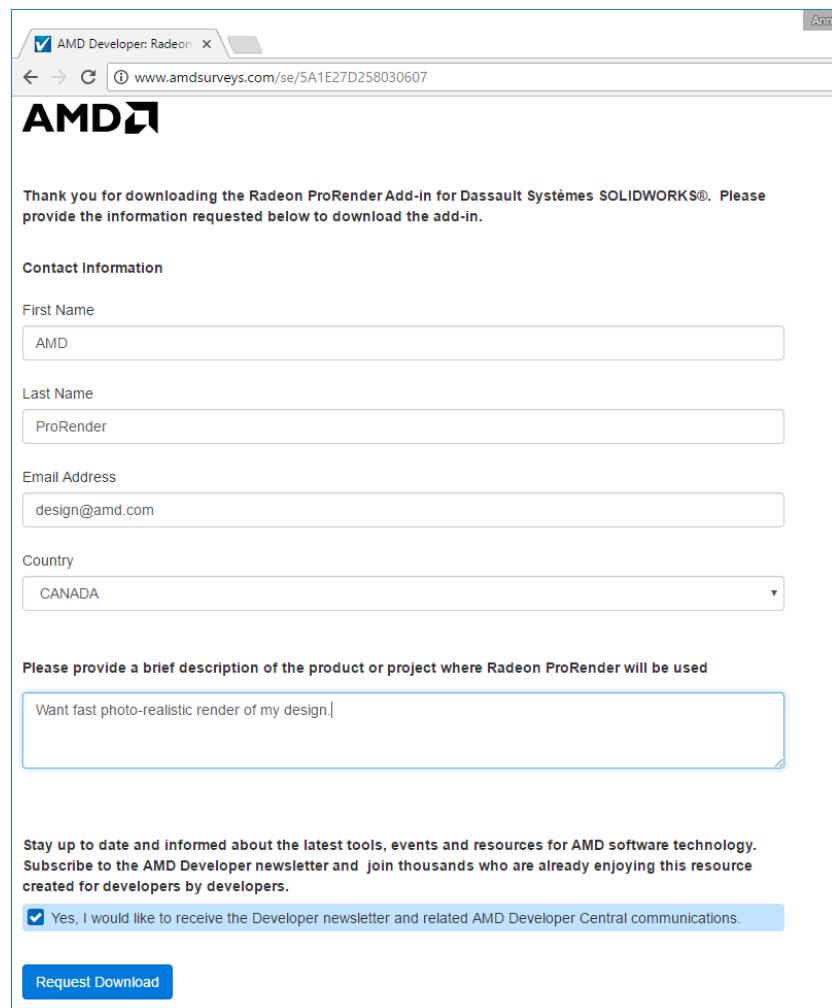
AMD Radeon ProRender will check your hardware and software to ensure requirements, before letting you select your installer settings.



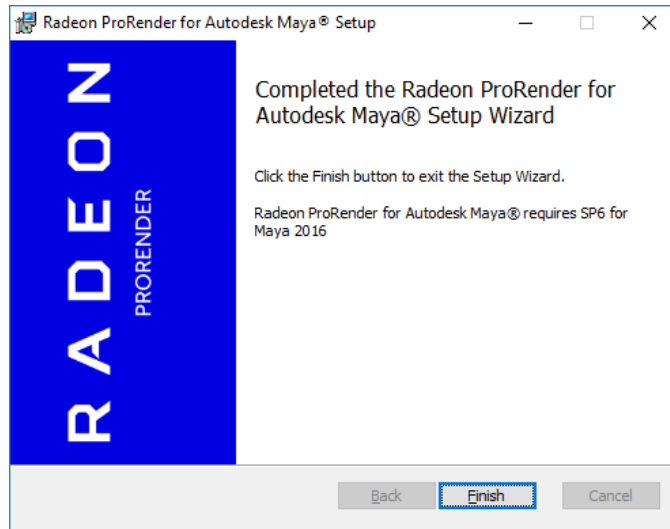
Click the **Register** button – it will take you to an AMD website to obtain an activation key by registering.



Register using your information. You will receive your activation key after clicking Request Download. Enter it into the installer and continue the installation.

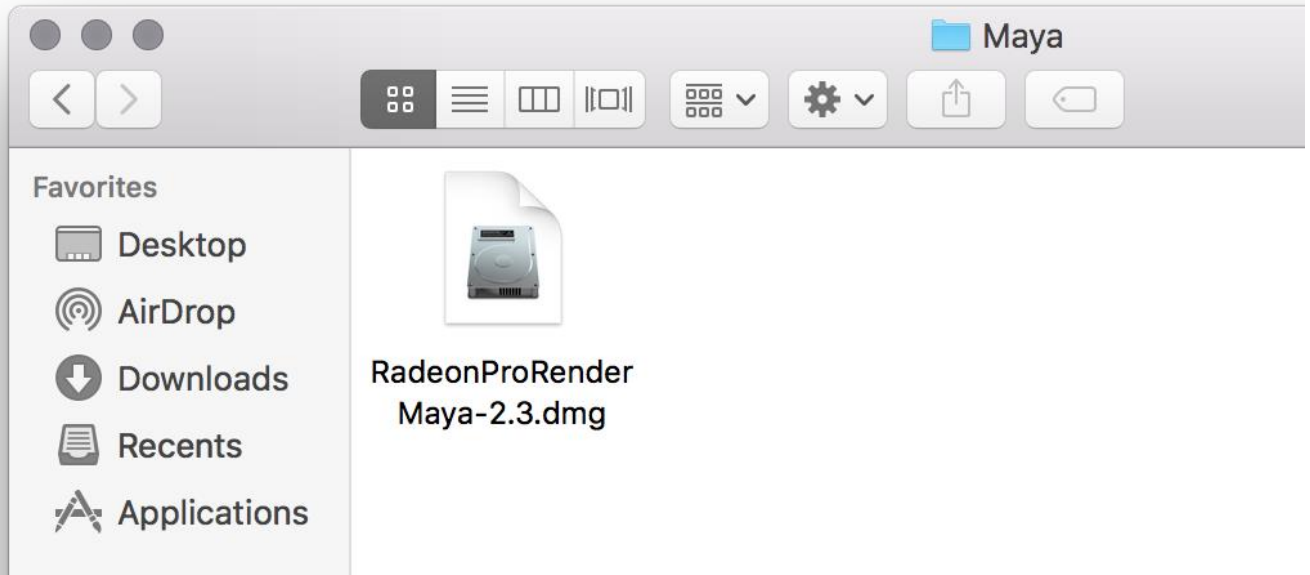
The screenshot shows a web browser window with the URL 'www.amdsurveys.com/se/5A1E27D258030607'. The page features the AMD logo and a thank-you message: 'Thank you for downloading the Radeon ProRender Add-in for Dassault Systèmes SOLIDWORKS®. Please provide the information requested below to download the add-in.' Below this is a 'Contact Information' section with fields for 'First Name' (AMD), 'Last Name' (ProRender), 'Email Address' (design@amd.com), and 'Country' (CANADA). A text area asks for a 'brief description of the product or project where Radeon ProRender will be used', with the text 'Want fast photo-realistic render of my design.' entered. At the bottom, there is a checkbox for 'Yes, I would like to receive the Developer newsletter and related AMD Developer Central communications.' which is checked, and a 'Request Download' button.

Click Finish and launch the Maya application to start rendering your images.

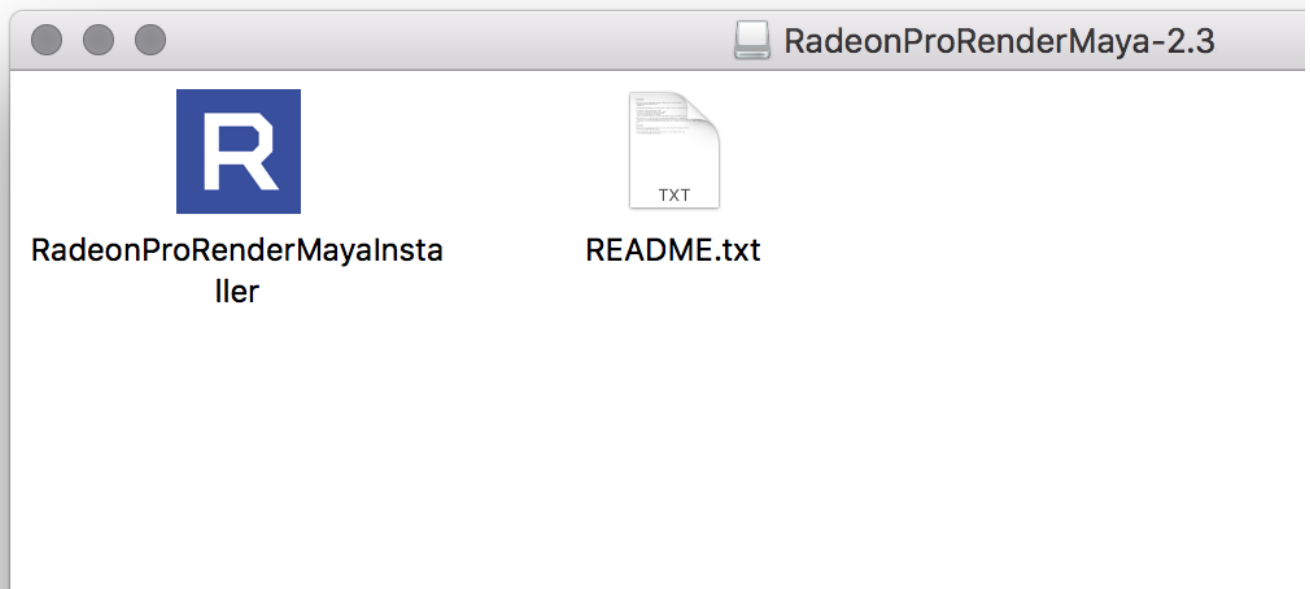


AMD Radeon ProRender for macOS

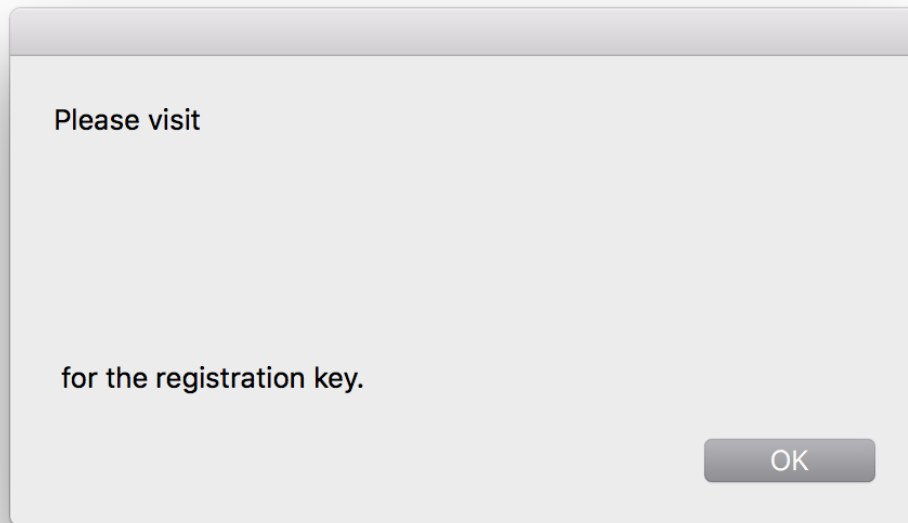
Download ProRenderForBlender-XX.dmg. Click to open.



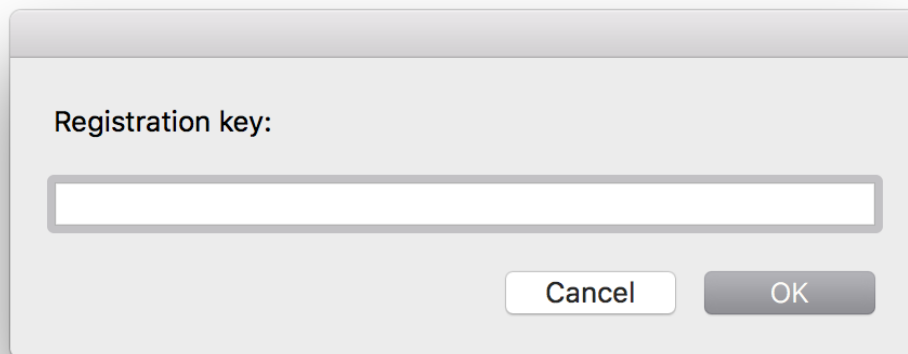
Open the **RadeonProRenderBlenderInstaller**.



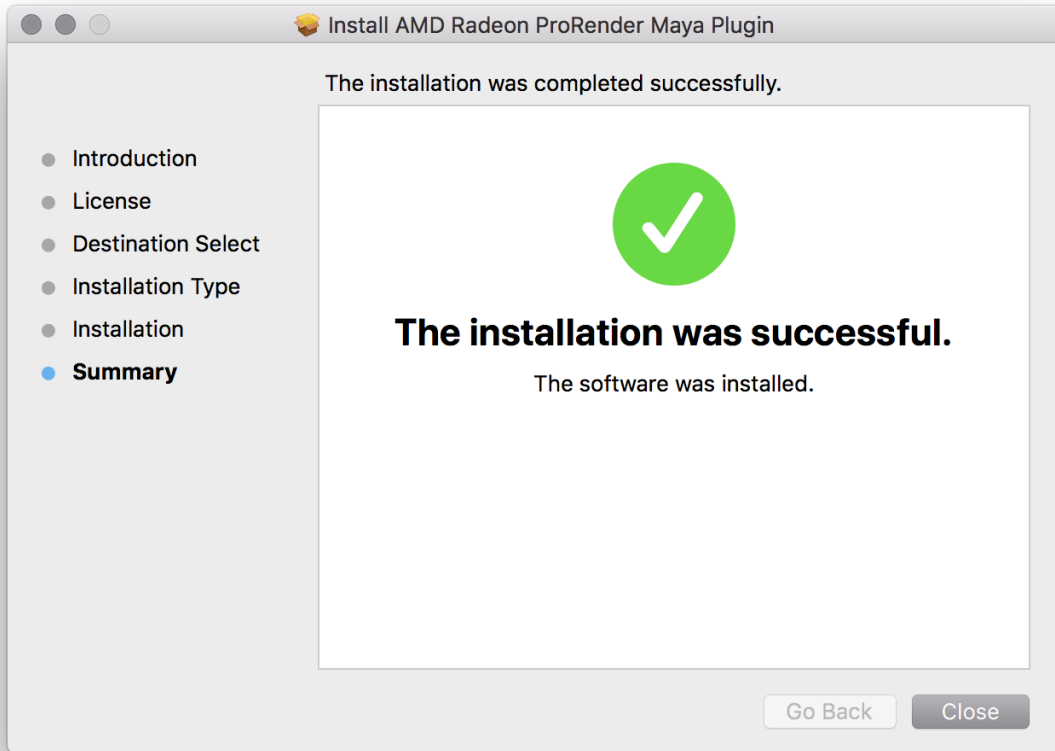
Copy and paste the website into browser to obtain the registration key.



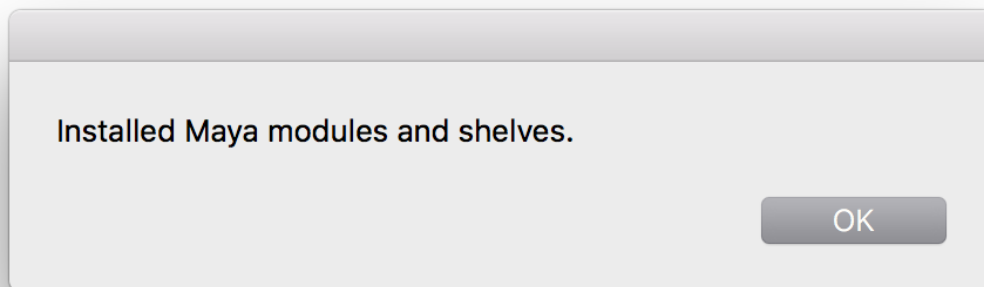
Enter the registration key that will be emailed to you.



Continue through the installation

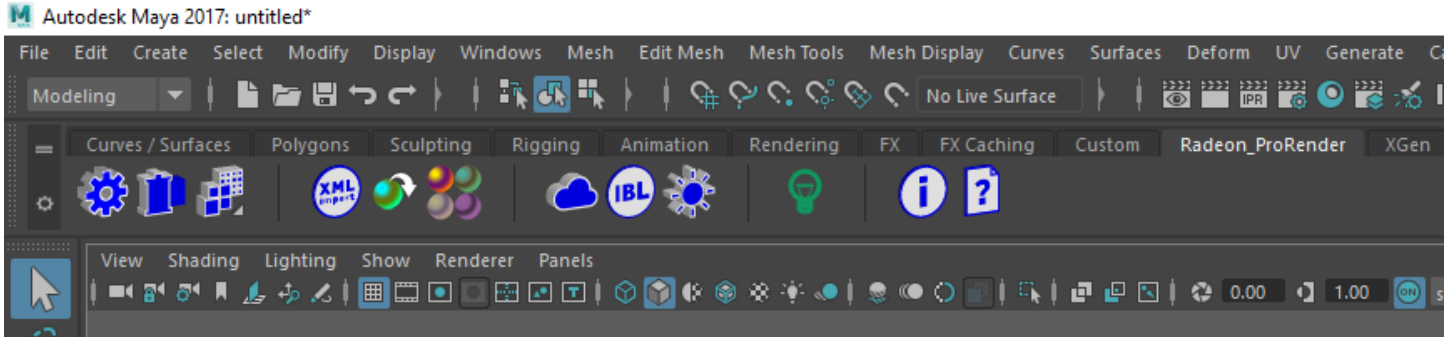


The Maya modules and shelves will also be installed.

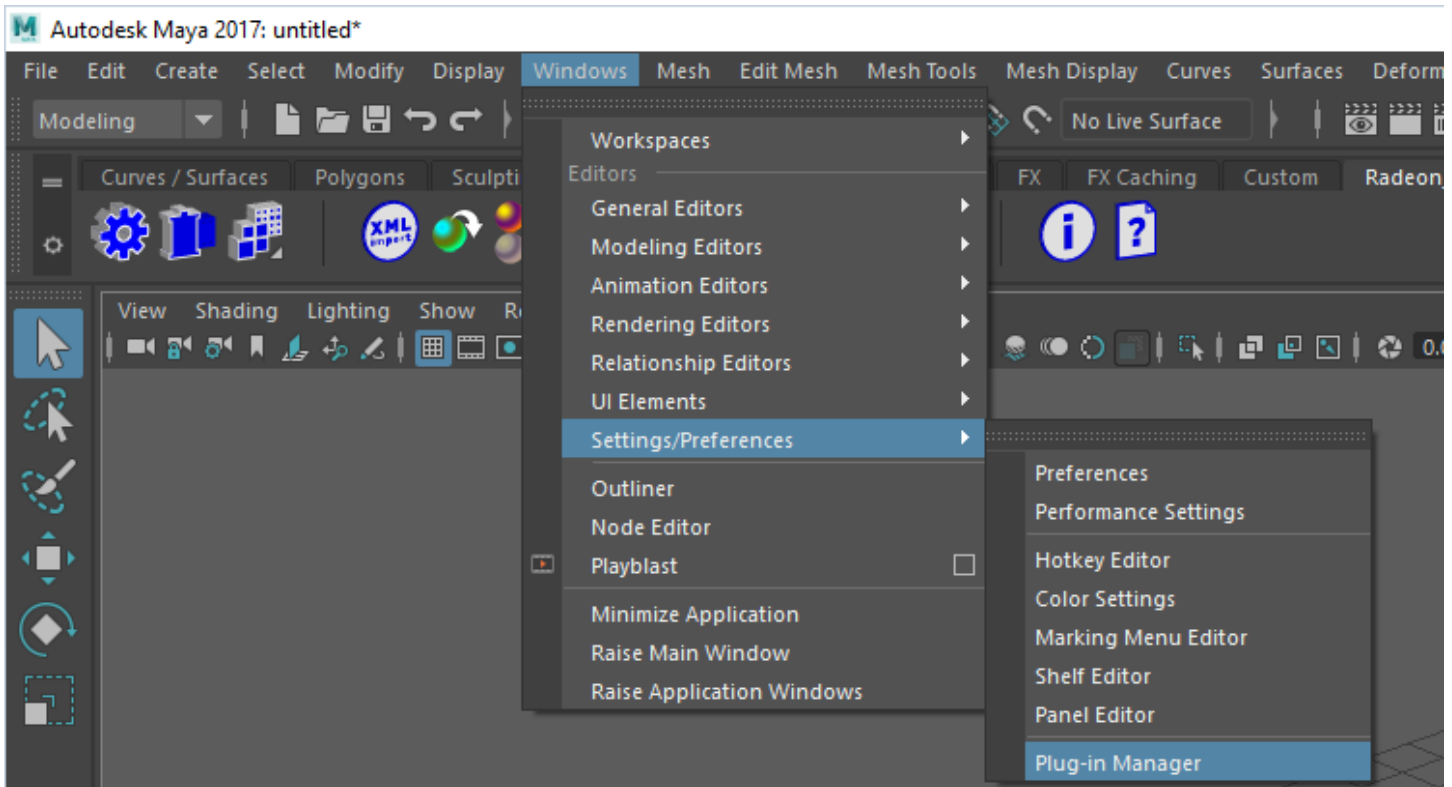


Switching to AMD Radeon ProRender

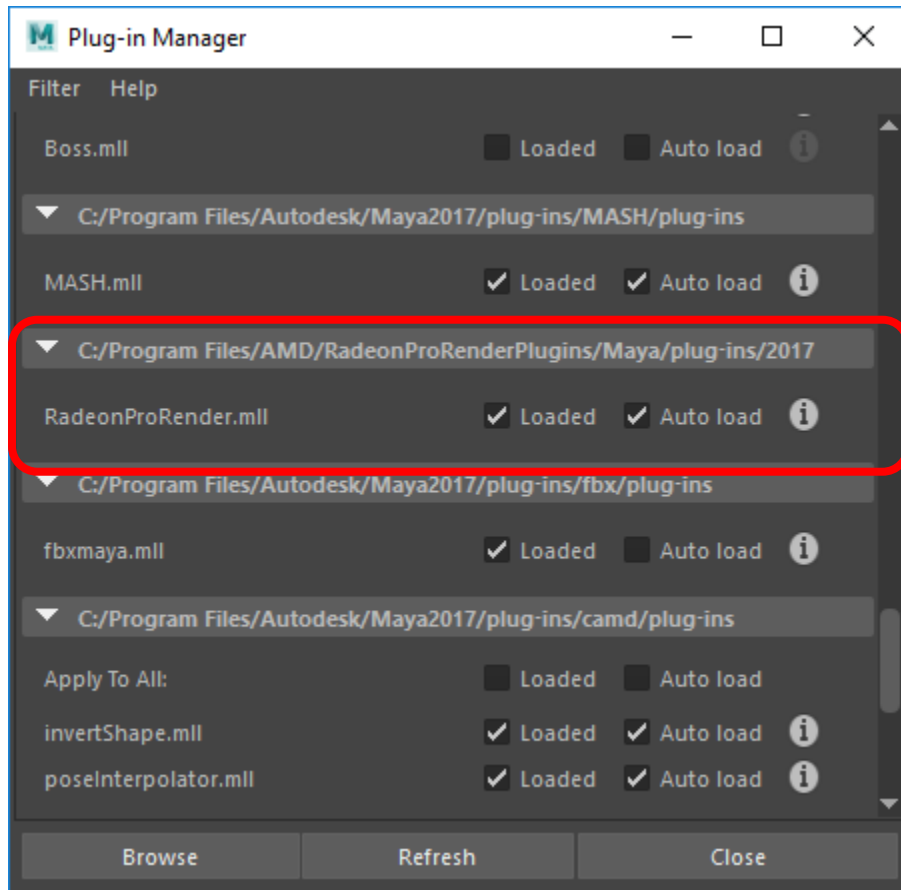
Launch Maya. You should see menu item for AMD Radeon ProRender, as well as a custom shelf with icons for key functions and settings.



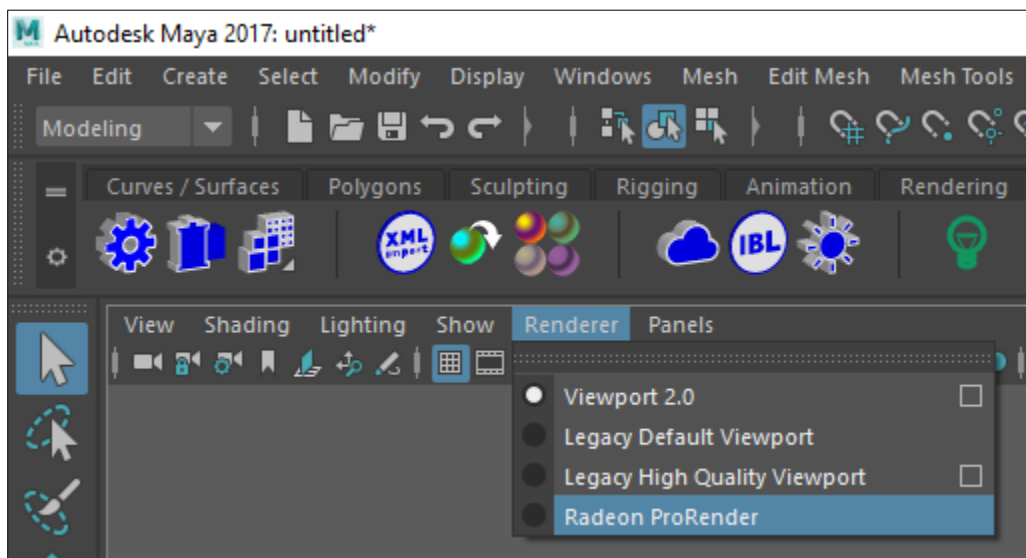
Go to **Windows > Settings/Preferences > Plug-in Manager** to set AMD Radeon ProRender as the renderer.




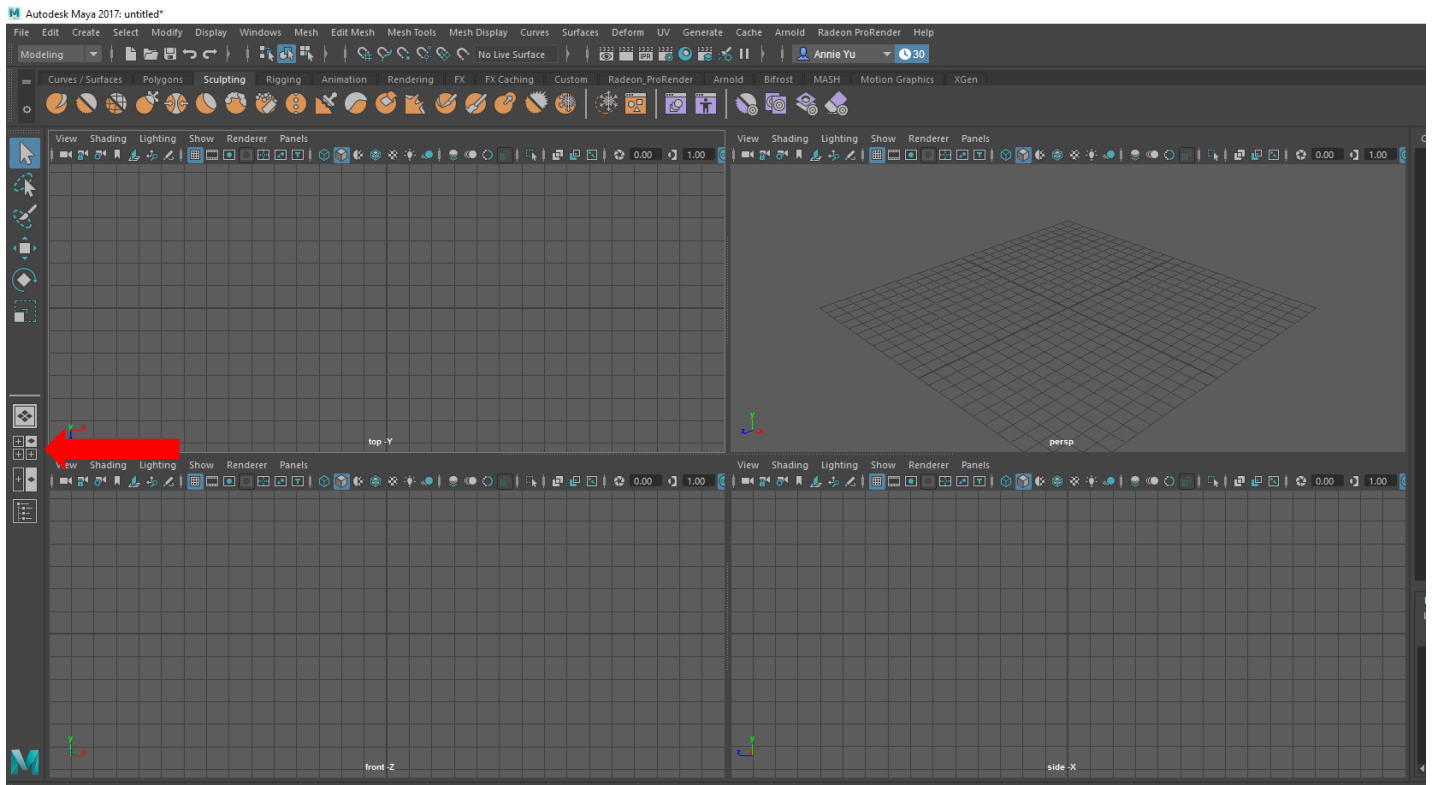
Under the Plug-in Manager, make sure the **Loaded** and **Auto Load** check boxes are ticked next to the **RadeonProRender.mll**. Press Close.



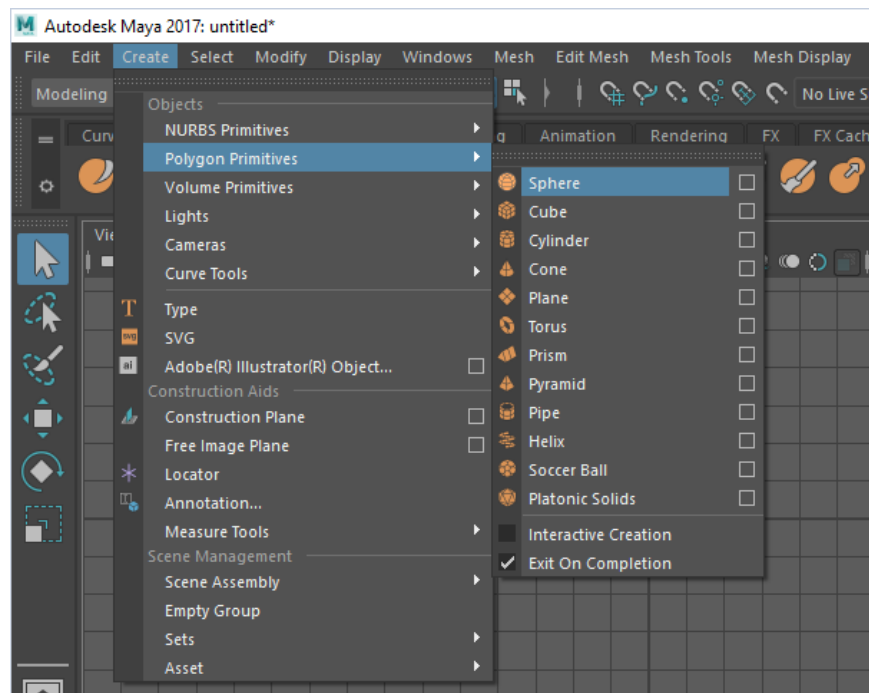
You will also be able to set the 3D viewport to the rendered view using AMD Radeon ProRender.



Change the layout to 4 x 4 by clicking the  button on the left-hand side.



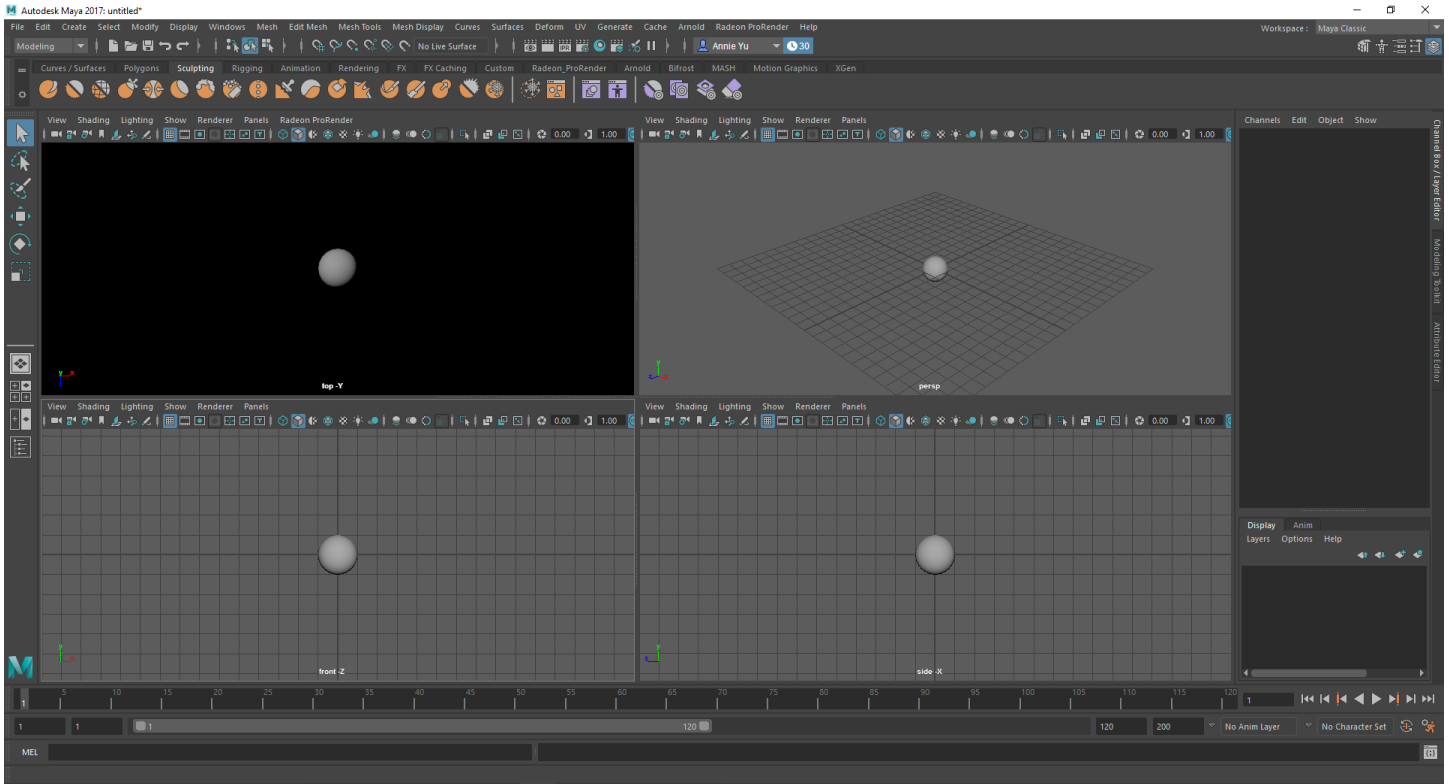
Create a sphere to make sure everything is working as expected. AMD Radeon ProRender will automatically create a light for your scene when you place an object. Create a sphere by selecting **Create > Polygon Primitives > Sphere**.




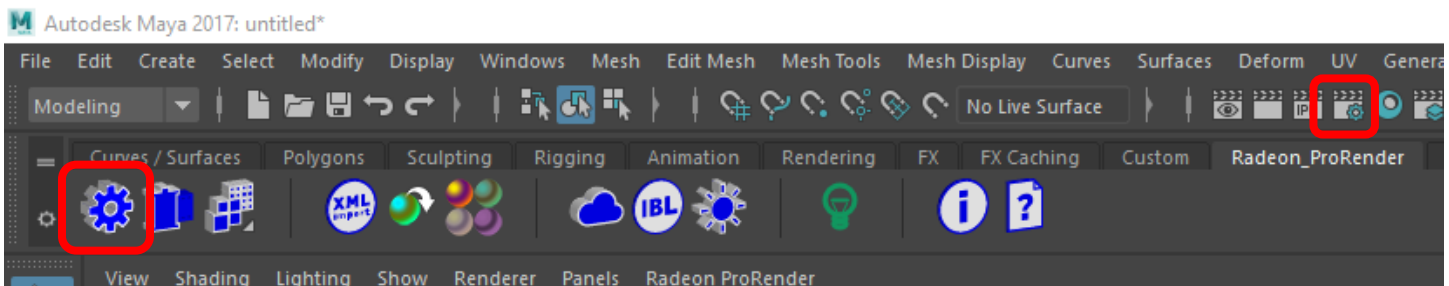
Set a viewport as the rendered view.



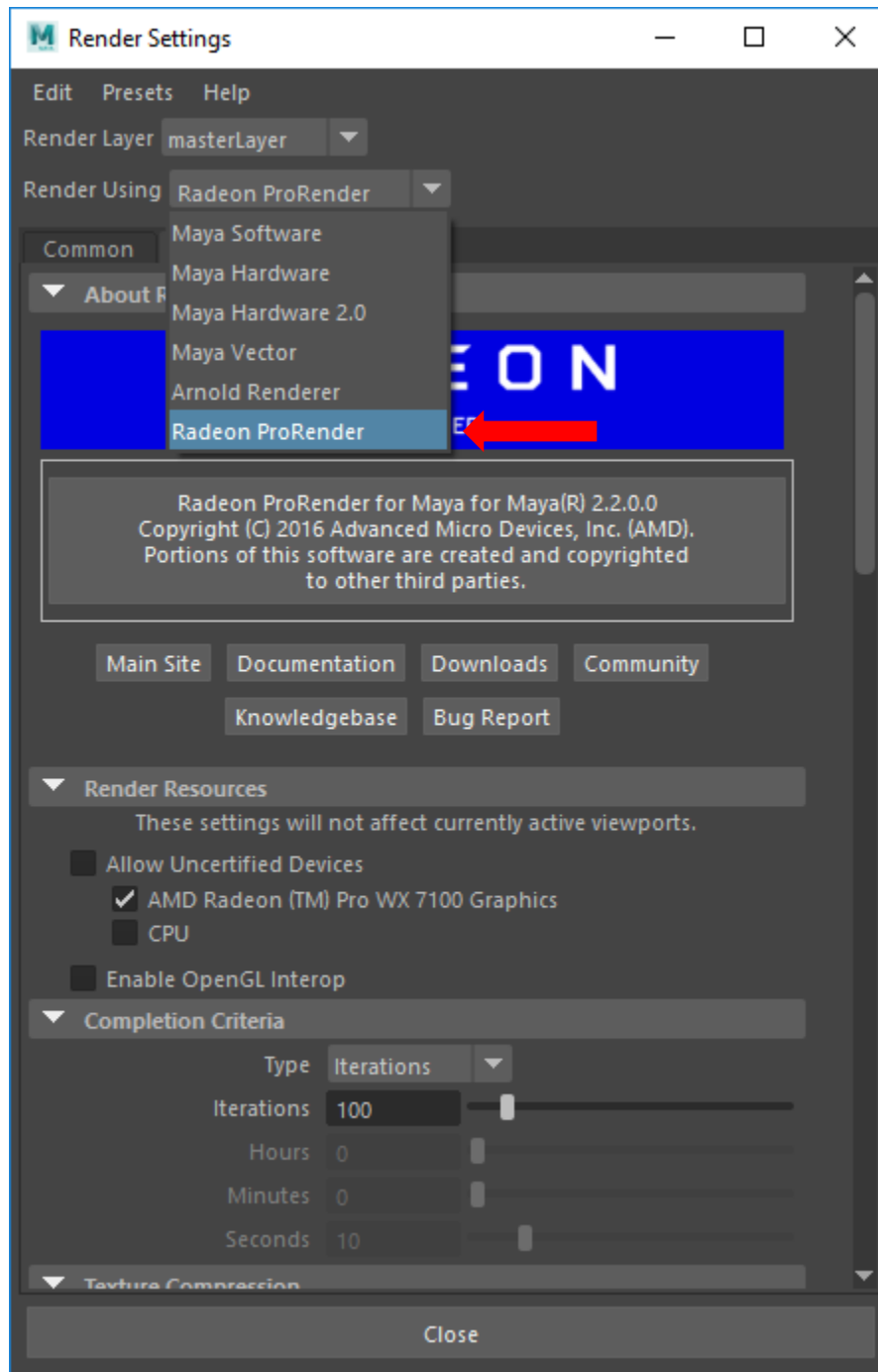
Note: There can be a delay the first time you use AMD Radeon ProRender. It may appear that the application has hung but it is simply doing some initial setup. The time to change renderers in the future will not have a same delay – it only happens this once when you first use it.



Bring up the **Render Settings** by clicking on the settings icon on the custom shelf in the **Radeon_ProRender** tab or, click the  button in the Maya tool bar to bring up the **Render Settings**.

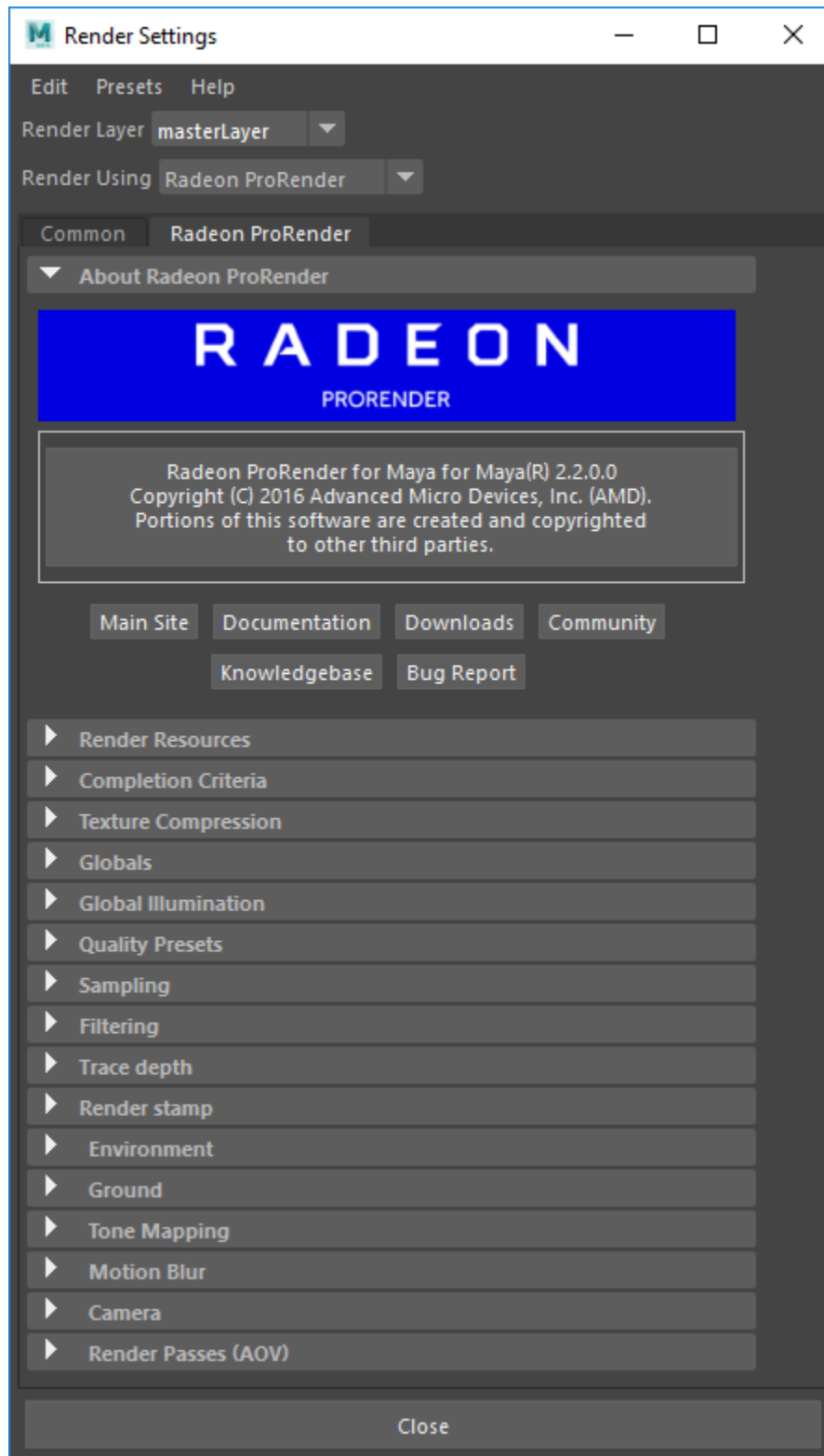


In the **Render Settings**, change to the **AMD Radeon ProRender** as the Renderer.



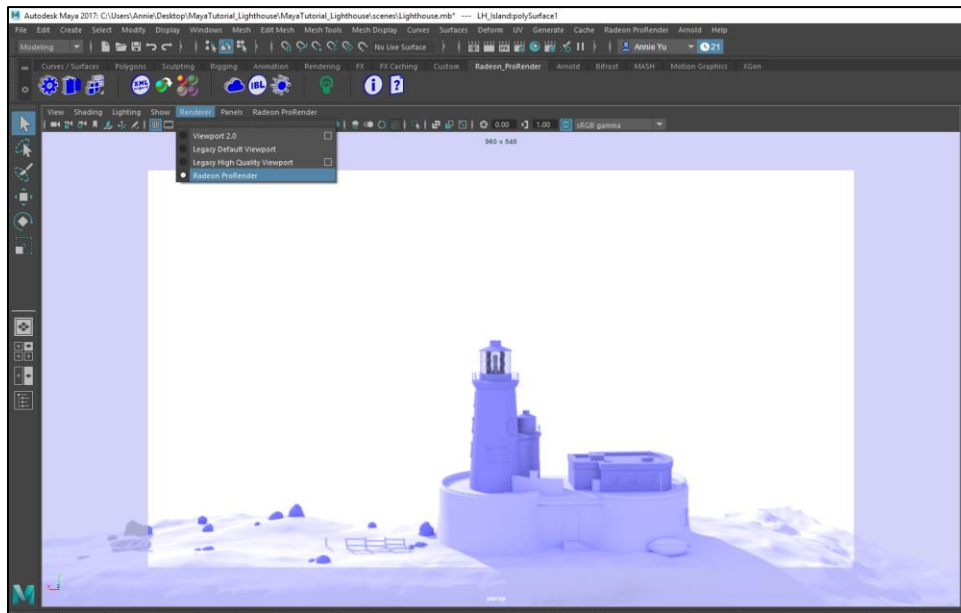
Overview of User Interface

Render Settings

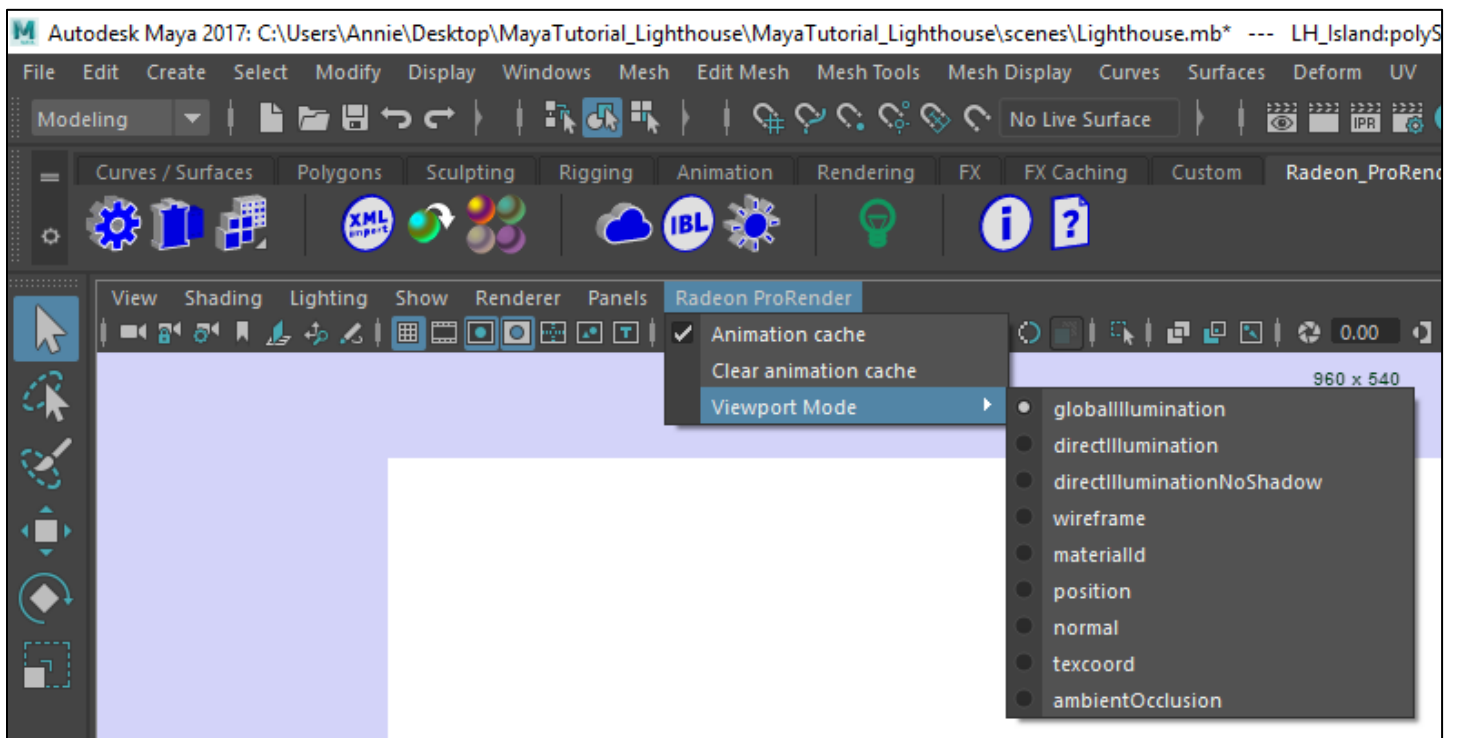


Render Viewports

After setting AMD Radeon ProRender as our renderer, locate the **Renderer** dropdown on the viewport menu and select **AMD Radeon ProRender**. You should see your viewport switch to AMD Radeon ProRender viewport and it will start cleaning up the render.



Open the **AMD Radeon ProRender** drop-down from the viewport menu.



Animation cache

This is used where you can view quick previews of animated object(s) in the scene before rendering the scene. It stores the first render iteration for each frame of the animation when the frame is first displayed, so the next time that frame is displayed, it can show the cached version, rather than having to render it again. This will allow you to scrub through the time-line without having to re-render the cached frames.

Clear Cache

This is used to clear the animation cache so the render can start over or re-render.

Viewport Mode

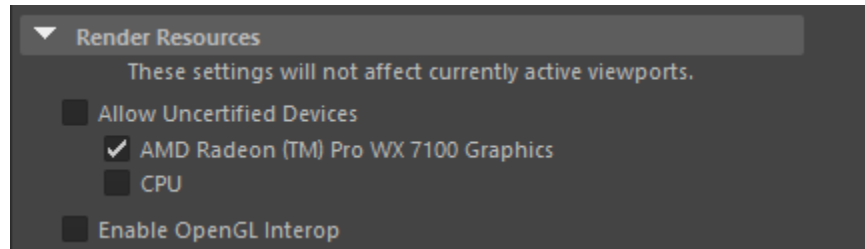
This is like render modes which are found in the **Render Settings**. The render mode can be selected without opening the **Render Settings** window.

AMD Radeon ProRender Settings

Open the **Render Settings** window.

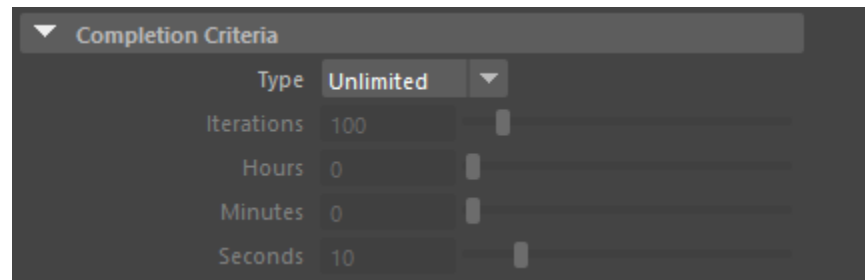
Render Resources

In the **Render Resources** section select your hardware to render. There are hardware options like GPU only, CPU only, or CPU and GPU together.



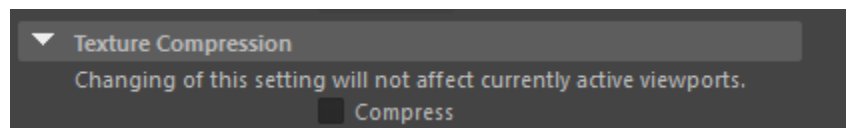
Completion Criteria

In the **Completion Criteria** set the amount of time you want your render to complete or set the iterations to the desired number of passes you would like AMD Radeon ProRender to render to complete to do before finishing.



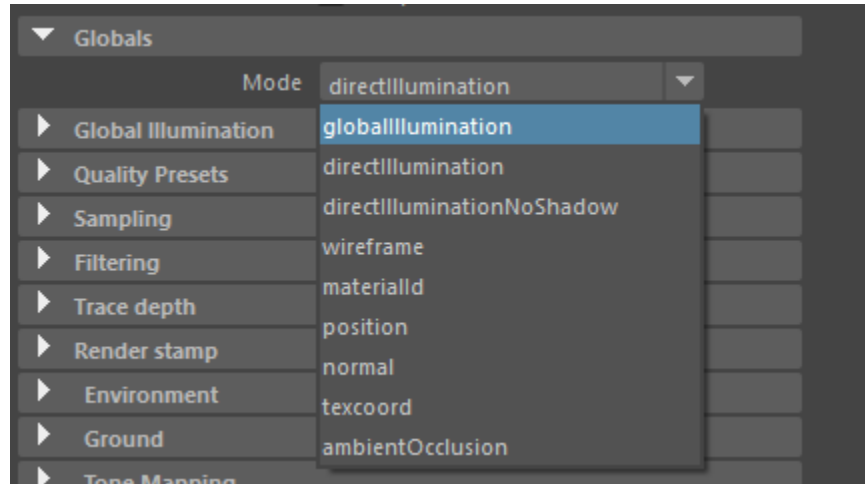
If there are no limits set for time or iterations the render will keep rendering until the user cancels the render or closes the render window.

Texture Compression



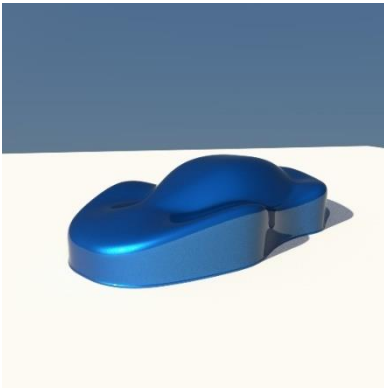
Globals

Globals provide you with the option of rendering in different modes. This changes the look of the 3D model in the viewport.

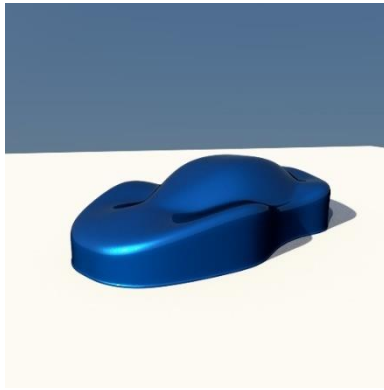


MODE	DESCRIPTION
GLOBAL ILLUMINATION	the full scene with full GI lighting and shadows
DIRECT ILLUMINATION	renders the scene with shadows, but no GI – gives “harsher” renders
DIRECT ILLUMINATION NO SHADOW	direct light, no GI, gives sharper renders without any shadows or semi-shadows
WIREFRAME	shows the wireframe of the mesh
MATERIAL ID	renders the whole scene in non-bordering colors to ease postwork/processing
POSITION	
NORMAL	renders the normals of the scene
TEXCOORD	shows the current texture coordinates – UV’d or not
AMBIENT OCCLUSION	standard pass to do anything from showing off your models without textures to using it as an overlay for contact shadows, which GI doesn’t always catch

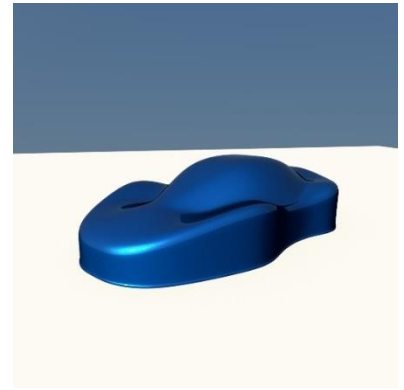
Global Illumination



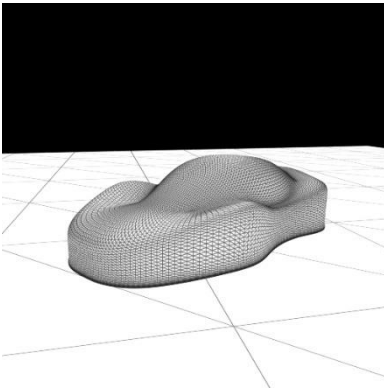
Direct Illumination



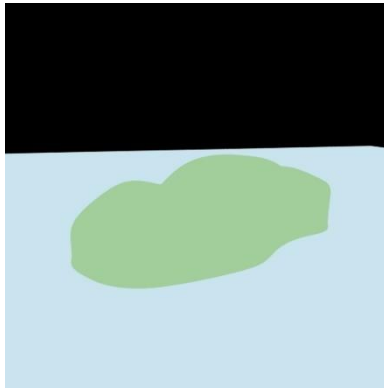
Direct Illumination No Shadows



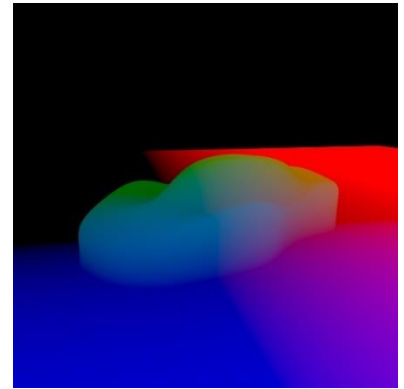
Wire Frame



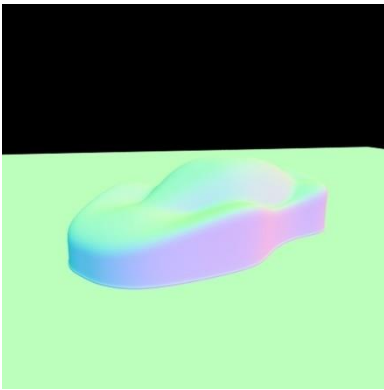
Material ID



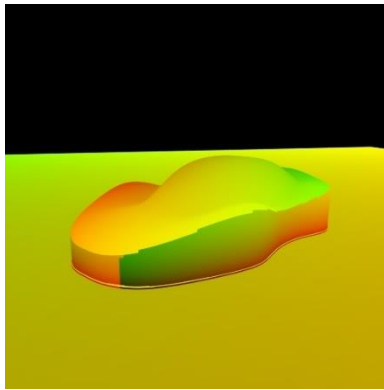
Position



Normal



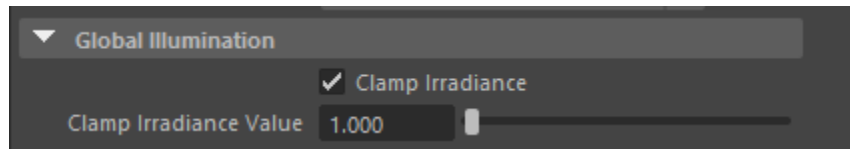
Texcoord



Ambient Occlusion

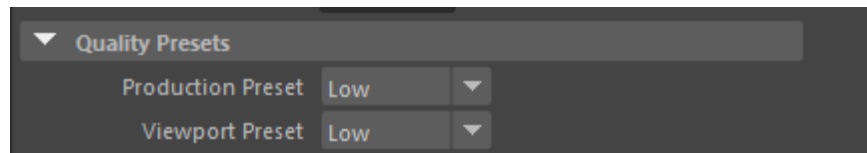


Global Illumination



Quality Presets

With AMD Radeon ProRender we have 2 sets of settings, one for the **Production** rendering and one for the **Viewport** rendering. We can use the quality presets, these range from low to medium to high.



Sampling

We can also use the **Sampling** section to increase the anti-aliasing. AMD Radeon ProRender's anti-aliasing smooths the pixels in an image, by oversampling single pixels as if they were five pixels or more, and calculating the average. This will in many cases get rid of the harsh edges you can see in some renders with no AA set.



Tip: A high number of samples gives you a better render at the cost of render time.



Filtering

The **Filter** section is used to add a filter on a sub pixel level. Several post render image filters are also supported including:



FILTERS	DESCRIPTION
BOX	the lowest quality Anti-Aliasing filter
TRIANGLE	for sharp results
GAUSSIAN	provides blurry Anti-Aliasing
MITCHELL	default filter, good for all-round rendering on images with no major high contrasts
LANCZOS	a second good all-round filter
BLACKMAN HARRIS	complements the Box and Gaussian filters, and is especially effective for Wireframe renders, as it makes edges look smoother

Trace Depth

The **Trace Depth** section allows a user to set the number of rays that will be cast and bounced around in the scene and is especially necessary for refractive surfaces. This is done by increasing the value of the **Max Ray Depth** input.

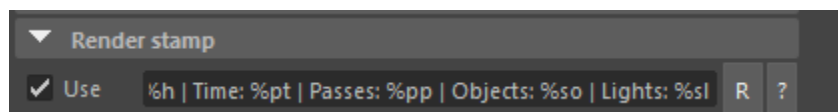


Tip: When using glass or other translucent appearances, use a high number of Ray Bounces to fully capture all reflections (generally, a good number is 6 unless there are complex, translucent parts).

The transparency and colour of the object is improved with more ray bounces. Improved image quality comes at a cost to other factors.

Render Stamp

This will create stamp on final rendered image showing details of hardware and Maya scene information.

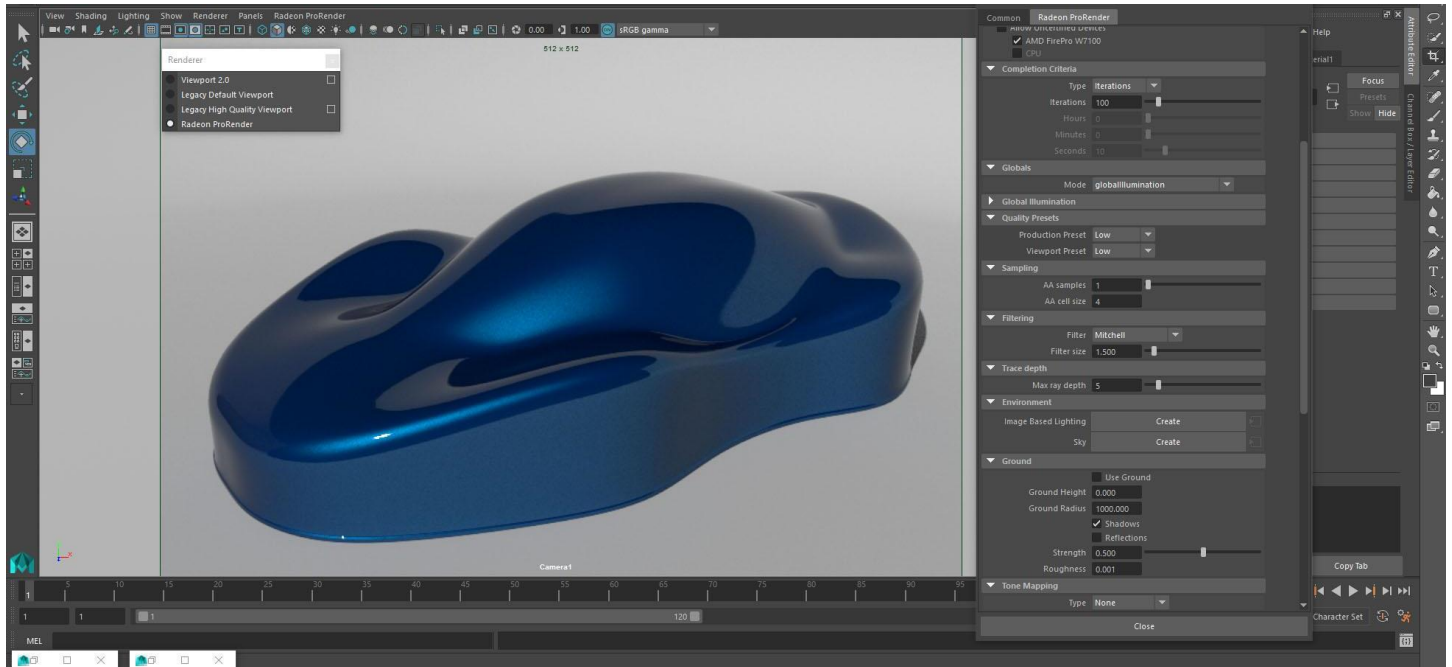


Environment

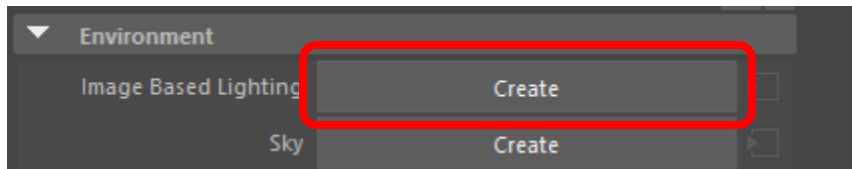
There are 2 options for Environments: **Image Based Lighting** and **Sun and Sky**

Image Based Lighting

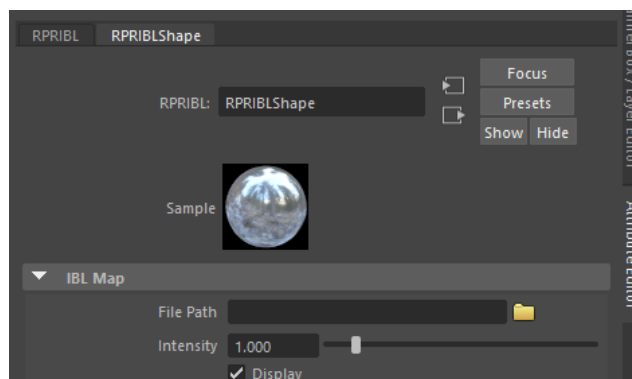
IBL is essential for creating real world lighting. It is basically a spherical image (HDR) that is projected onto a spherical object as your environment to simulate real world lighting.



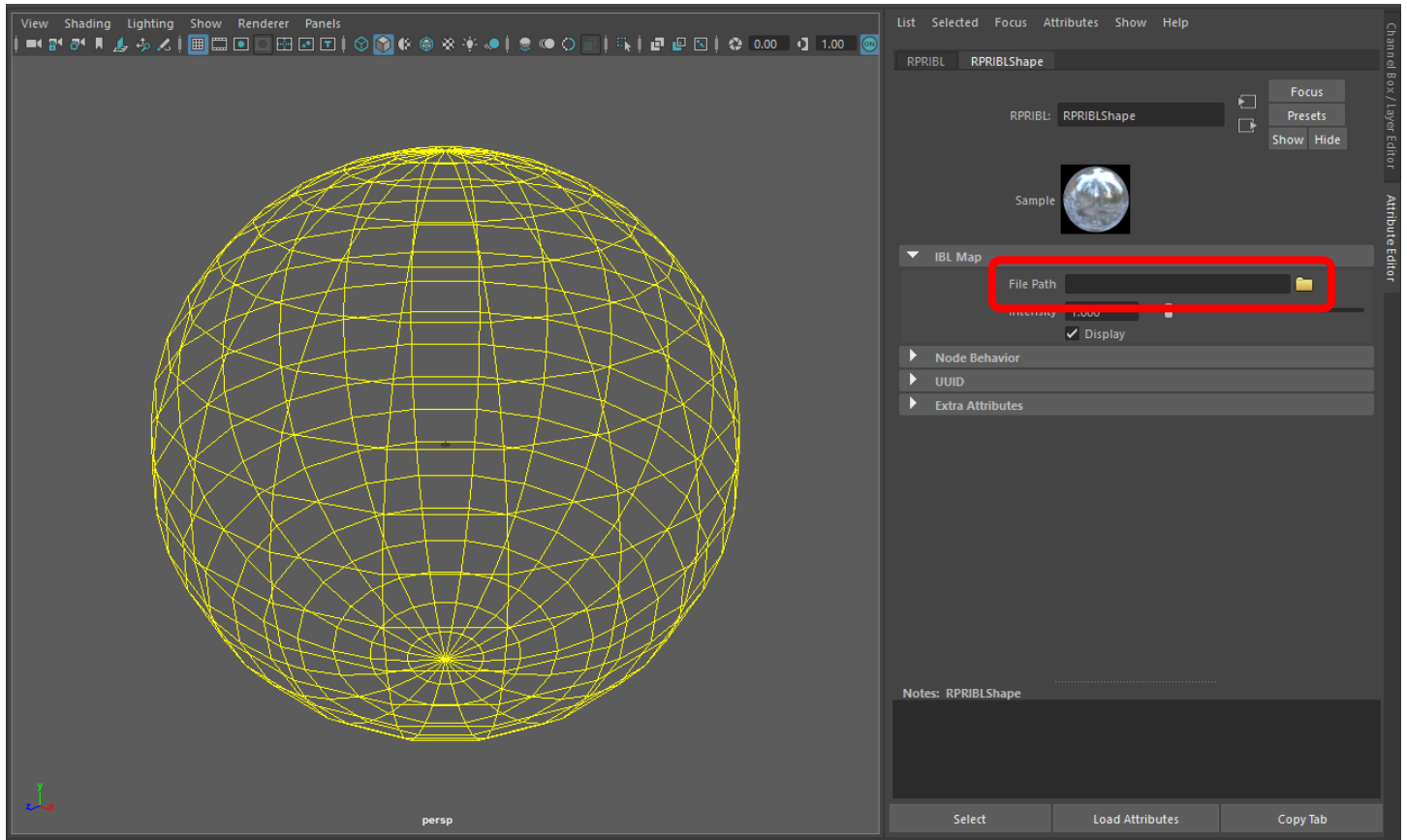
Enable the IBL by clicking on the create button in the Environment section in **Render Settings**.



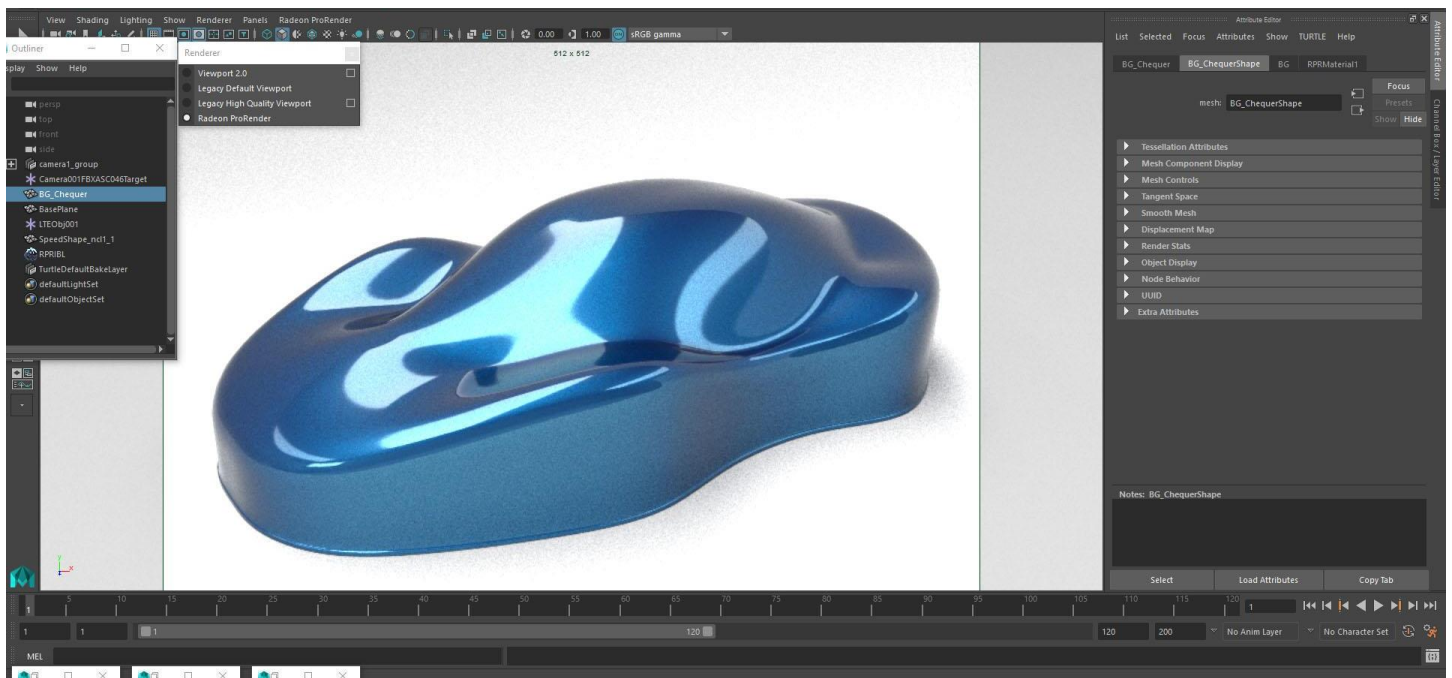
After clicking on the create button You will notice that the attribute editor now has **RPRIBLShape** loaded. Locate the IBL map section and find your IBL\HDRI file.



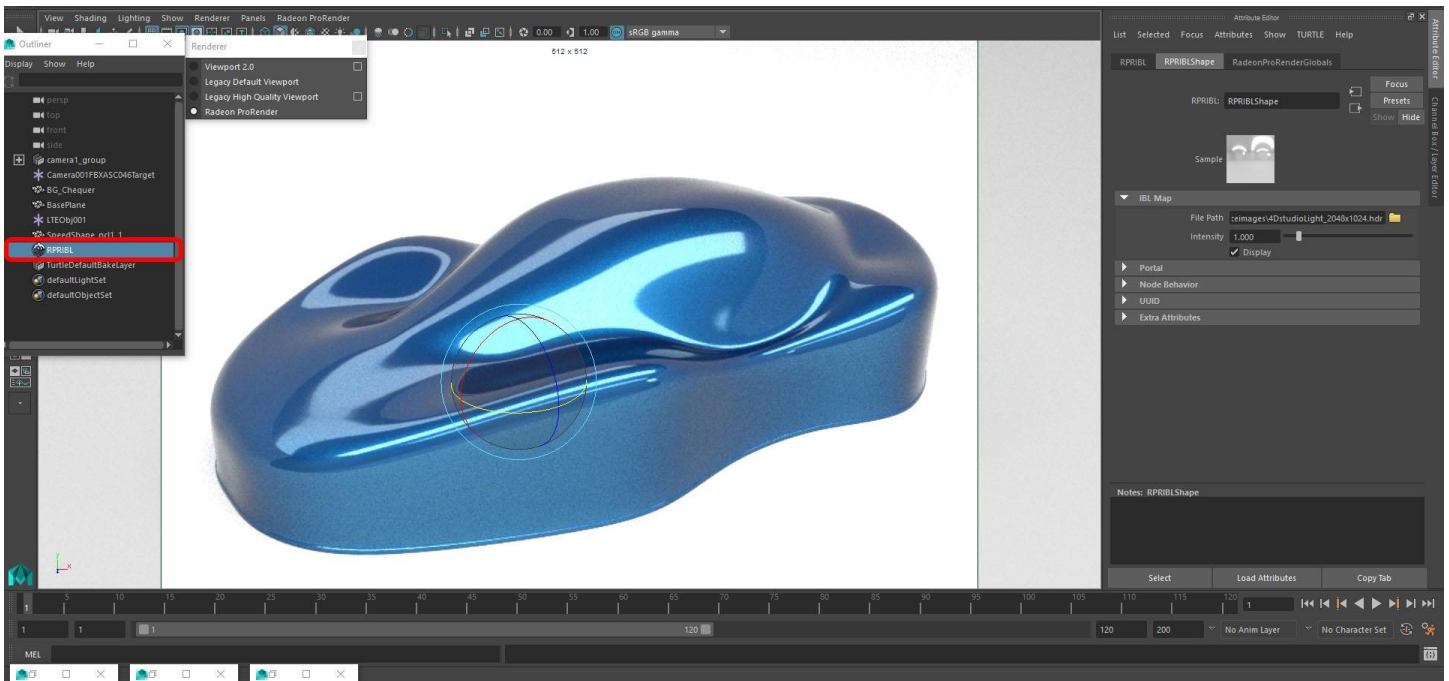
Click on the folder icon, locate your HDRI file go ahead and load it into your scene. As you can see after loading the IBL into the scene the default lighting has been removed and replaced by the IBL.



You can see the reflections on the car shape model's reflective surface that are being cast by the IBL.

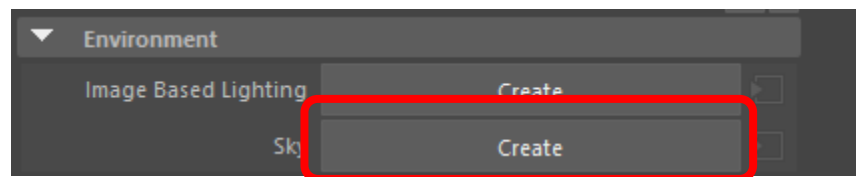


While in AMD Radeon ProRender viewport We can adjust the lighting intensity and overall look by selecting the IBL and changing the intensity value. We are also able to rotate the IBL to get different reflections.

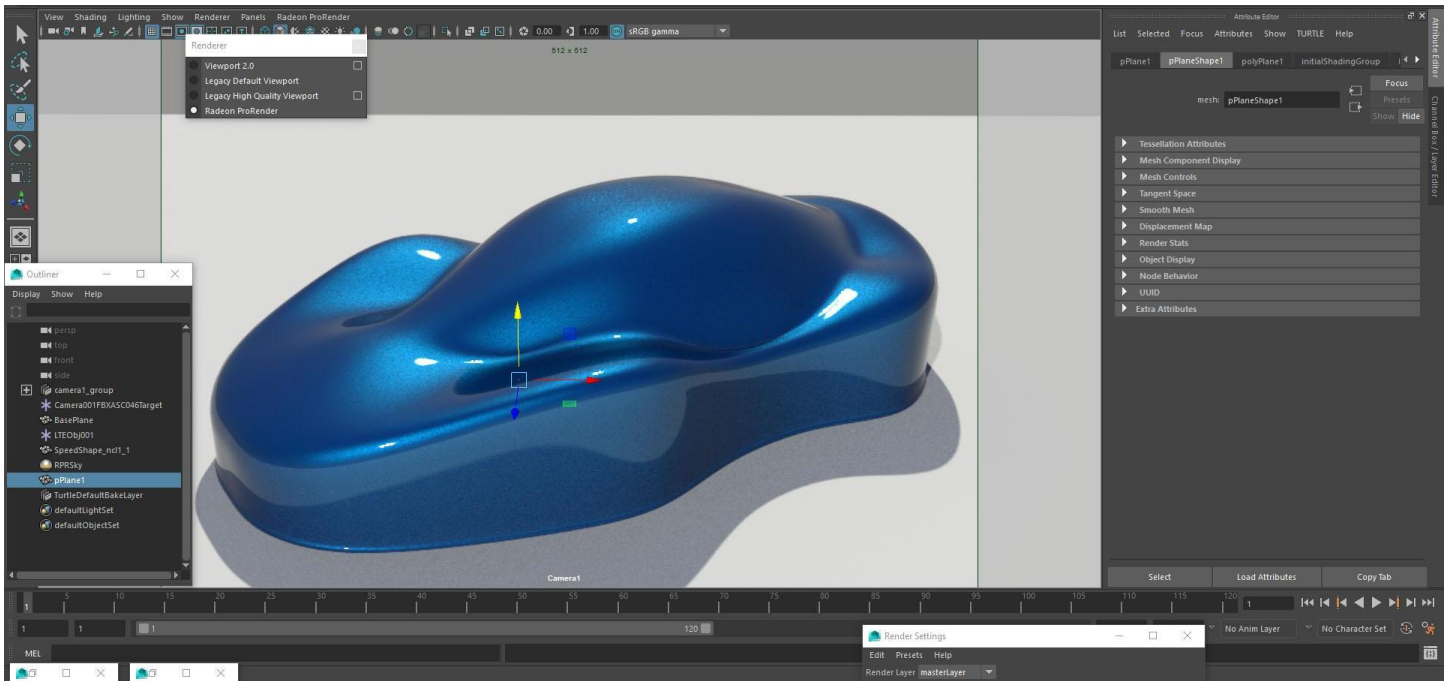


Sun and Sky

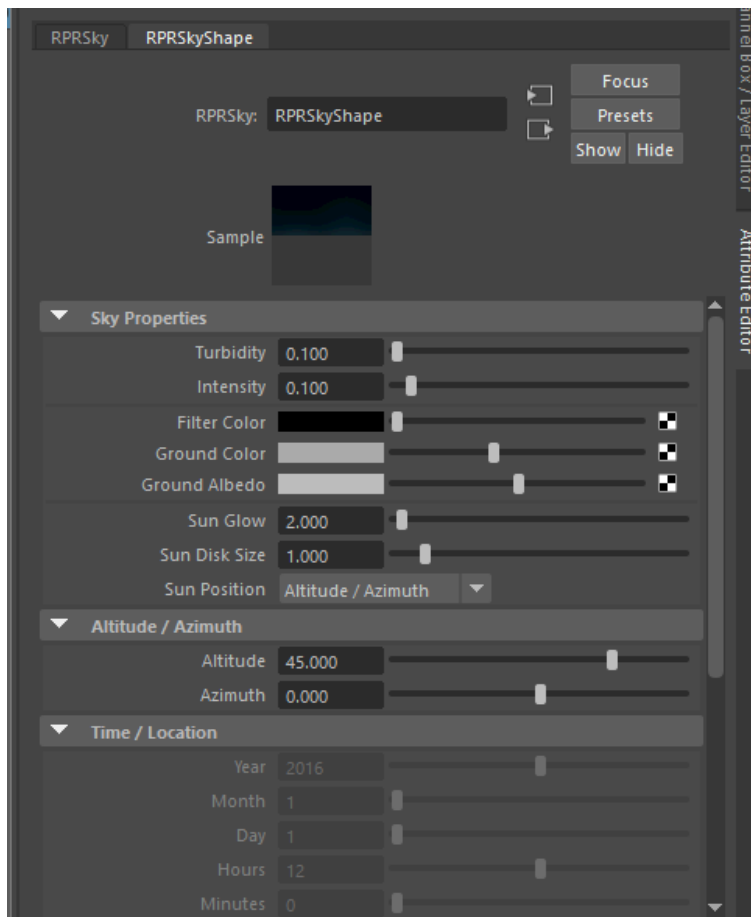
Sky is designed to enable physically plausible daylight simulations and accurate renderings of daylight scenarios. Under the **Environment** section in the **Render Settings**, create the Sky by clicking on the **Create** button (same as IBL).



This is what your scene should look like.

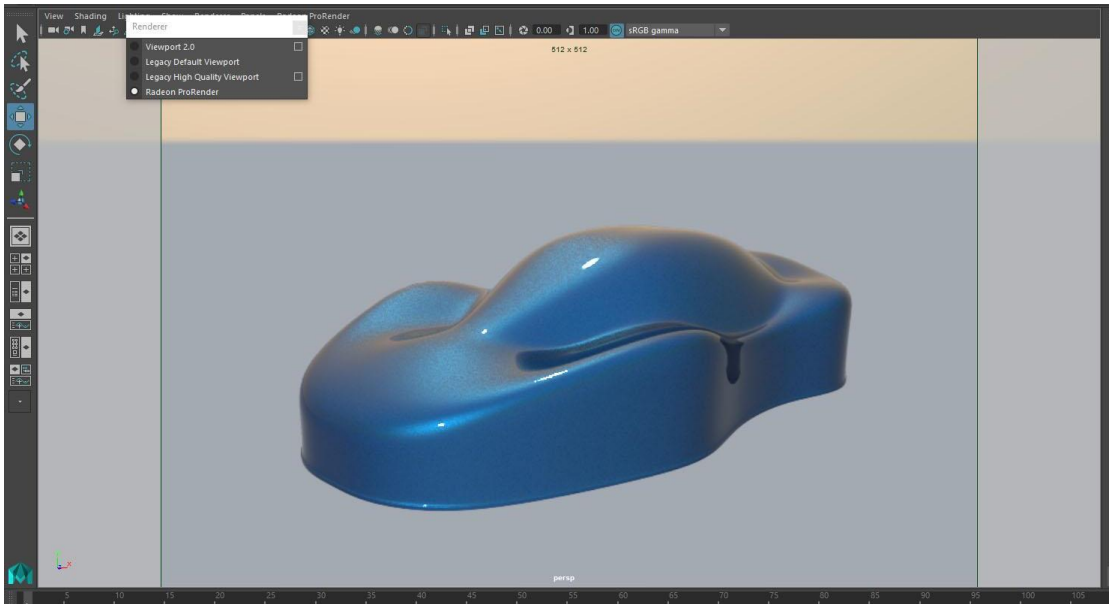


With the **RPRSky** selected, look in the attribute editor, you will see all the sky properties.



Turbidity

Increasing this value will simulate how much dust is in the air by changing the color of the sky to orange.

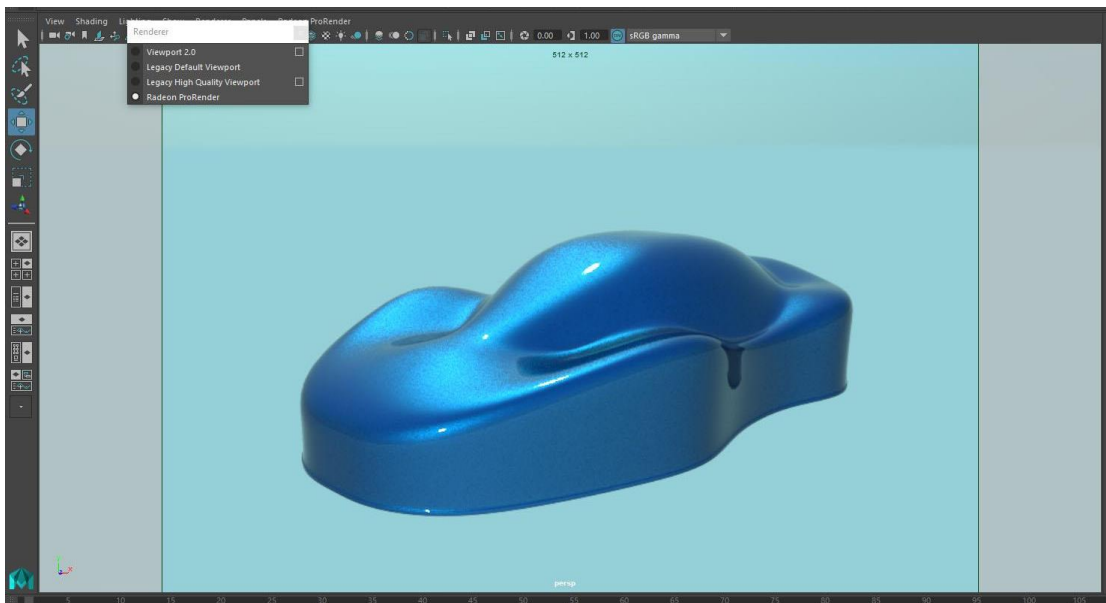


Intensity

This will raise or lower the intensity of the Sky

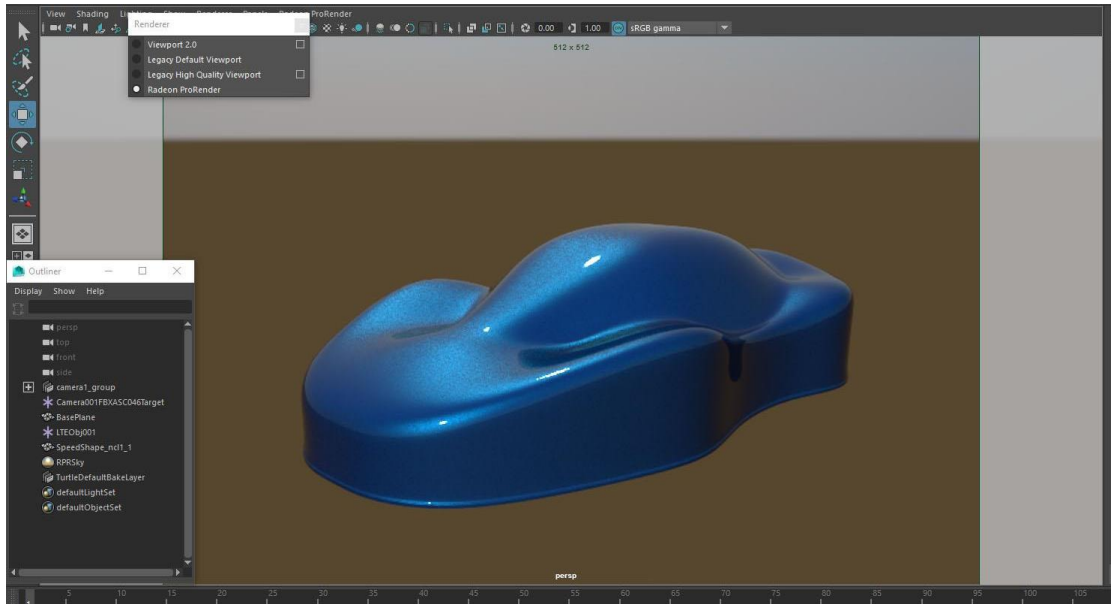
Filter Color

This is used to add a tint of color to you Sky. By clicking on the color box, you can select a color you wish to tint the Sky with.



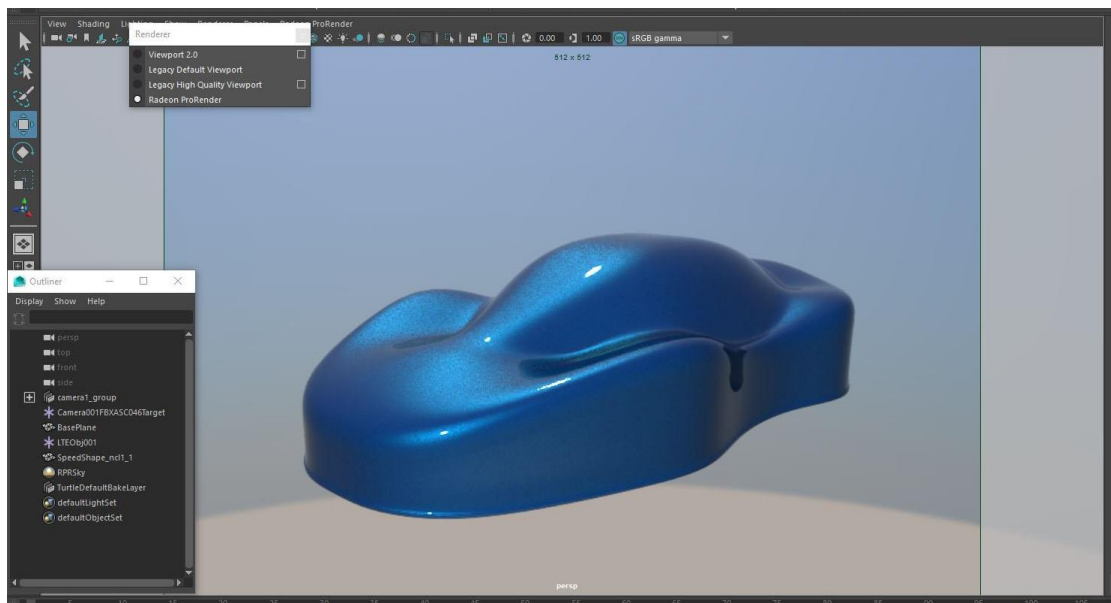
Ground Color

This is used to select the color for the ground by also clicking on the color box and picking a color.



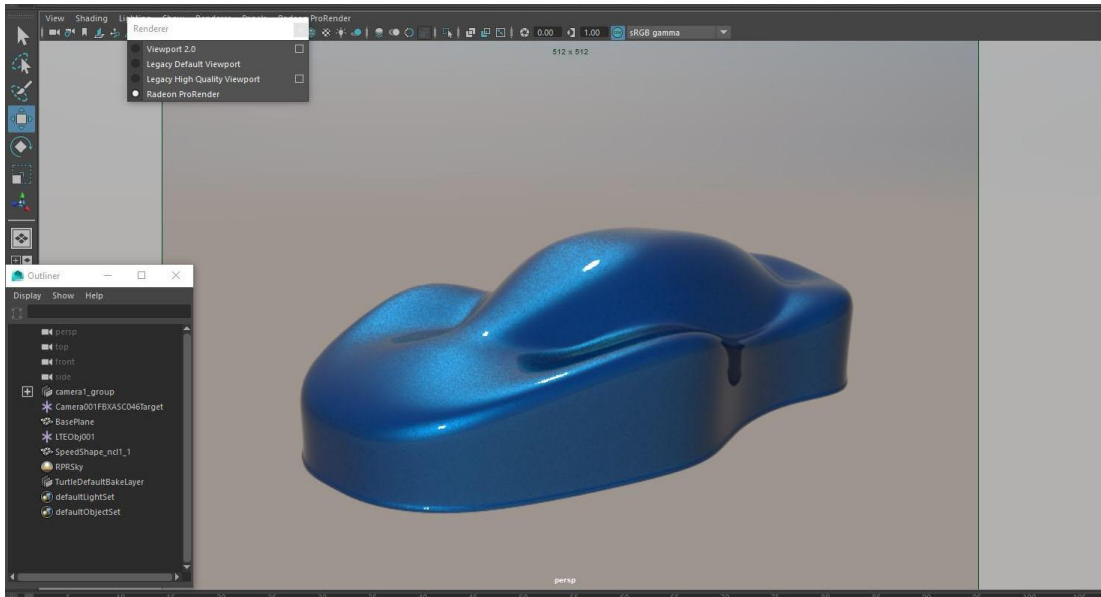
Horizon Height

This attribute will raise or lower the horizon line. Horizon height set to -4.



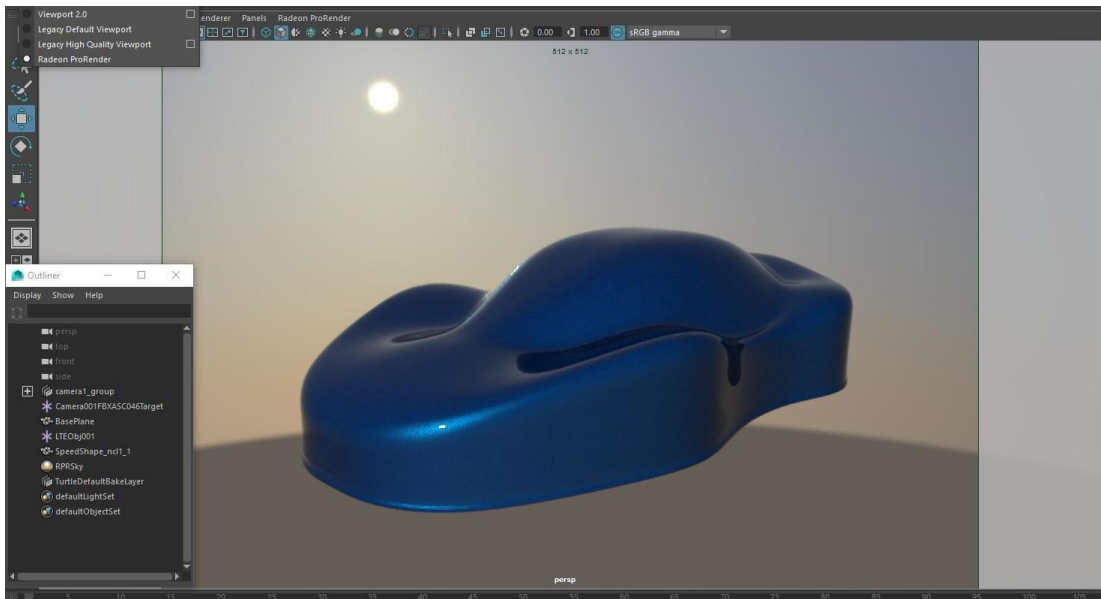
Horizon Blur

Increasing this attribute will blur the horizon and ground line.



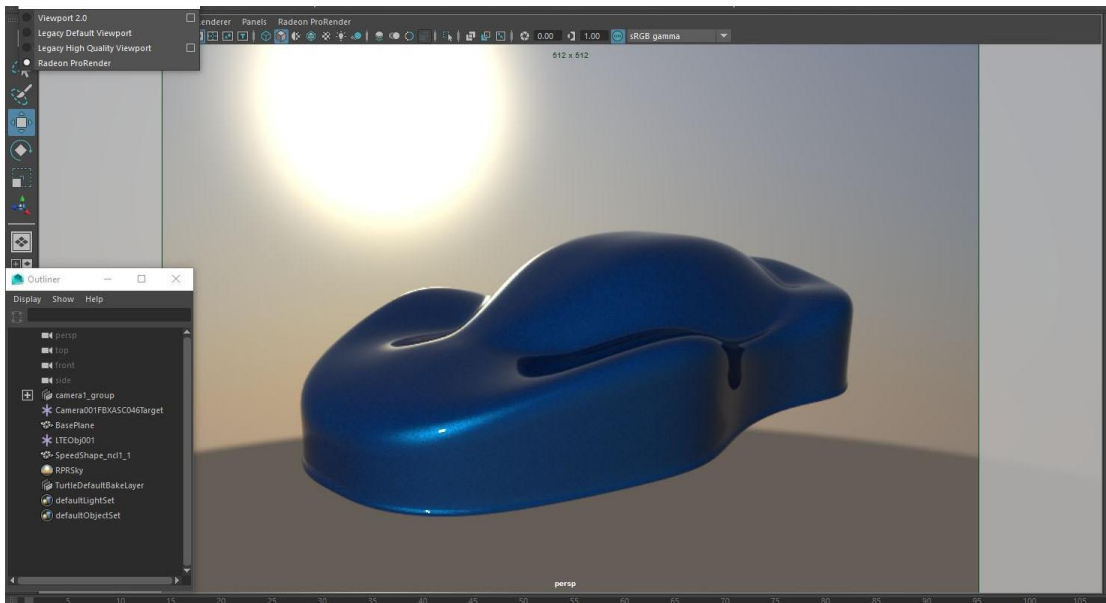
Sun Glow

Changing this attribute will increase the size of the Glowing halo around the sun disk.



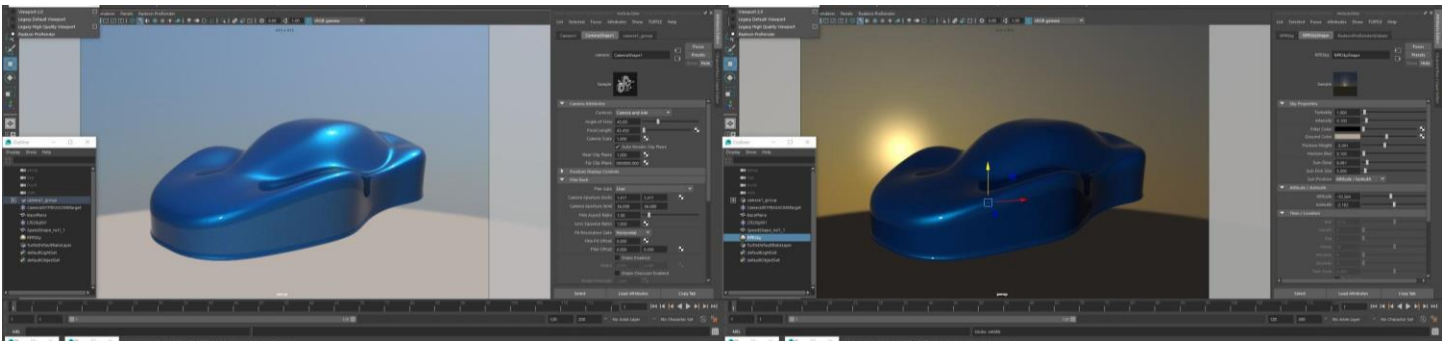
Sun Disk Size

This attribute is used to increase the size of the sun.



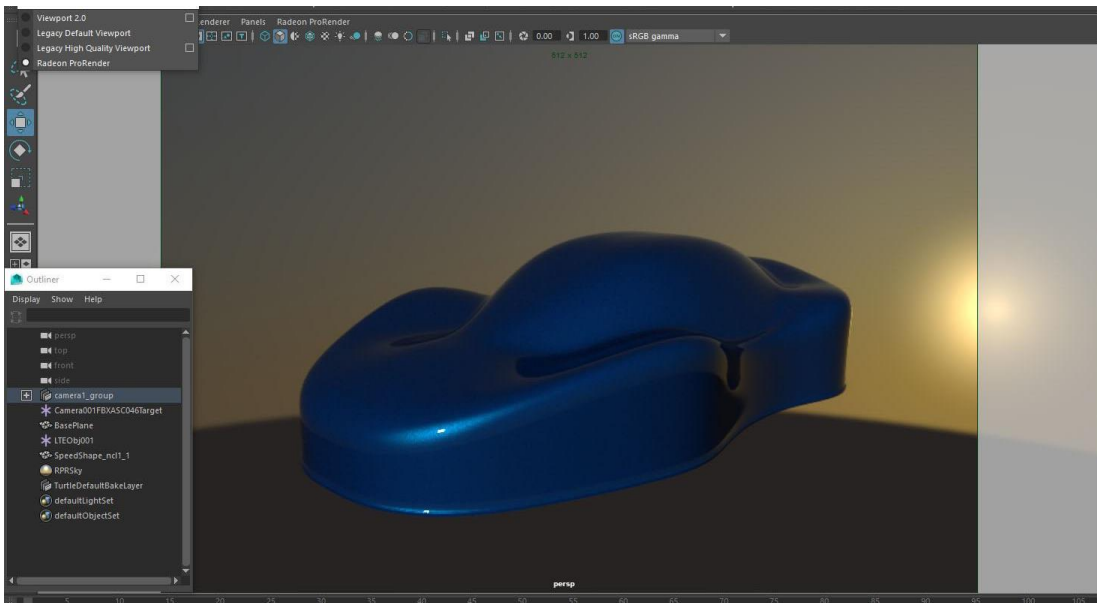
Altitude and Azimuth

These two attributes determine where the Sun is in the Sky. You will notice that if you lower or raise the altitude value you will be able to simulate a sunset or sunrise.



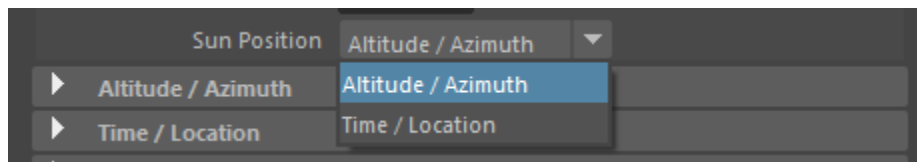
Azimuth

This attribute will change the placement of the sun by rotating the sun on the Y axis in the scene.



Sun Position

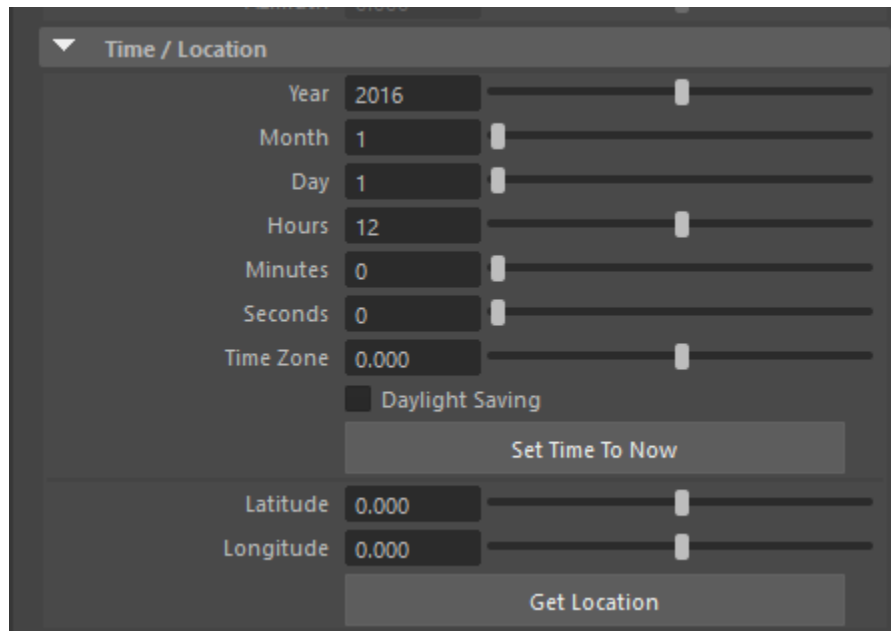
In this drop down, there are 2 options to control the Sky model:



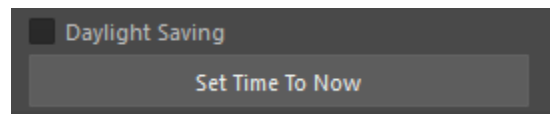
So far, the settings are on the Altitude/Azimuth setting. By switching to **Time/Location**, that the Time/Location section is available and the Altitude/Azimuth section is now greyed out and is no longer available.

Time/Location

This used to create lighting for any place in the world at any given time. To control the Sun position, the user has a set of options like Hours, Minutes, Seconds, Month, day, year, latitude and longitude, that allow the user to simulate a precise sun position.

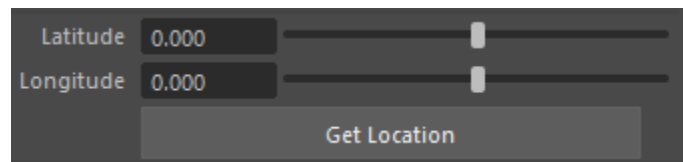


Tick the checkbox if you would like to enable **Daylight savings**. We are also able to automatically **Set Time To Now** simply by click on the button. It will use the Time from your System Clock and set it to that.



Latitude and Longitude

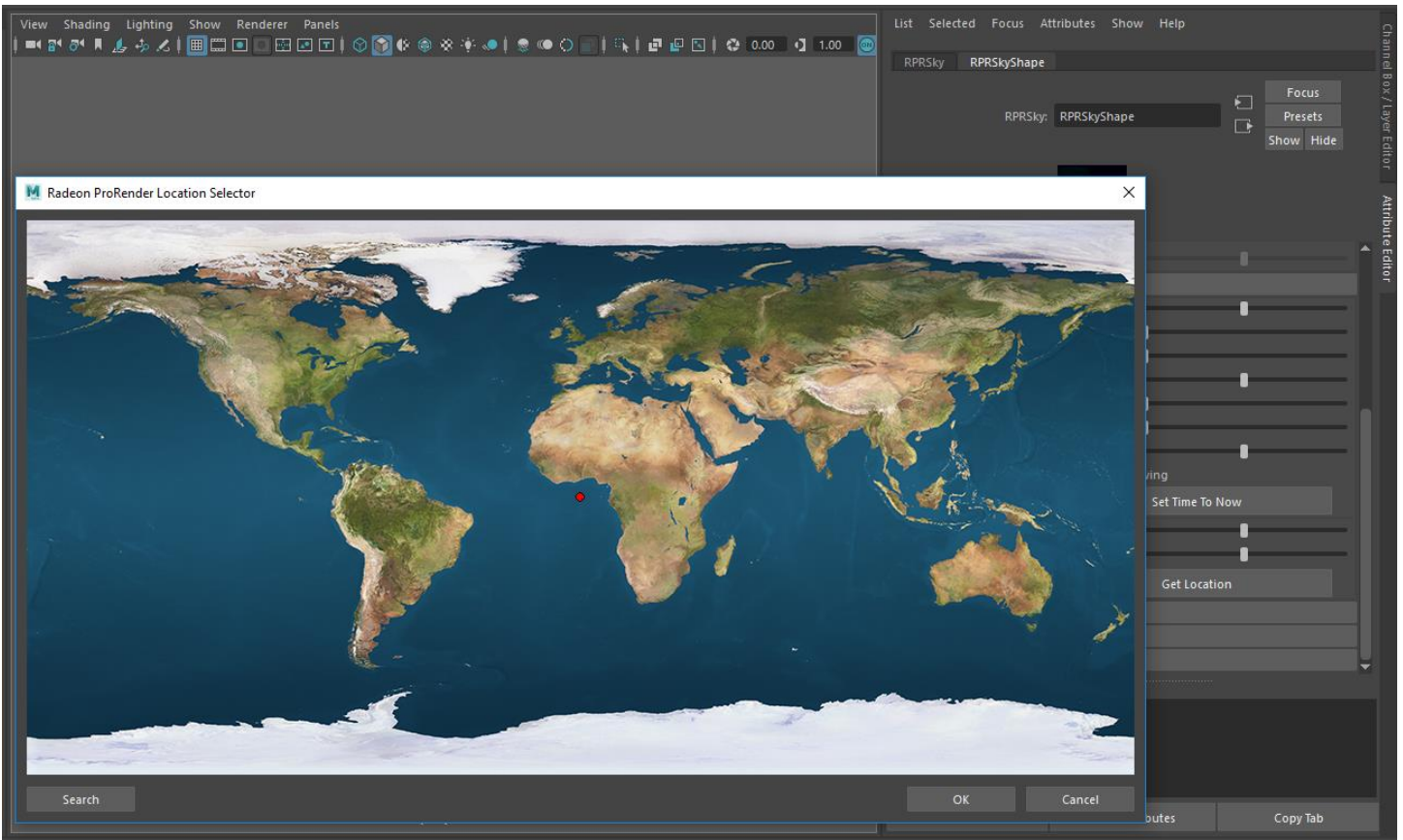
These 2 attributes work very like Altitude and Azimuth in that they determine where the sun is in the sky at any location.



Get Location

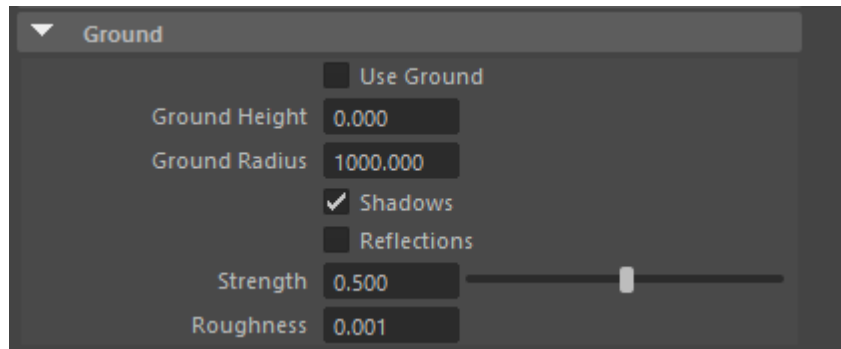
Clicking on the Get Location button will display a map to pick any location on the planet.

1. You can use the mouse to pick a place anywhere on the map. You will create a red dot where you have picked.
2. You can use the search option to more precisely find a certain city in any country.



Note: Most of the attributes for Sky are keyable for an artist to animate a full day cycle.

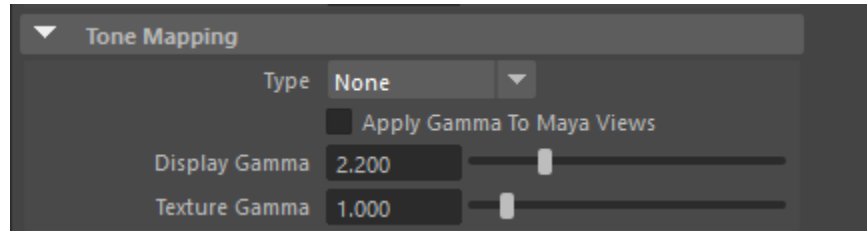
Ground



Tone Mapping

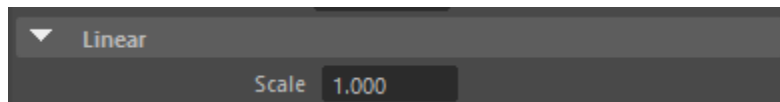
Tone mapping is a technique used in image processing and computer graphics to map one set of colors to another to approximate the appearance of high-dynamic-range images in a medium that has a more limited dynamic range.

With AMD Radeon ProRender we can use the **Tone Mapping** section in the **Render Settings** to select between five different tone mapping types: Linear, Photolinear, Autolinear, Max White and Reinhard02. You can also adjust display and texture gamma.



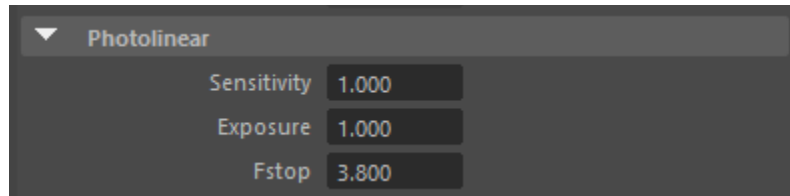
Linear

Raise or lower the brightness of the scene by increasing or decreasing the **Scale** value.



Photolinear

This is based on real-life camera settings. ISO is film speed – the higher the value, the more light is let into the image. F-Stop is aperture width, and follows regular camera settings – the smaller the number, the wider the aperture, and the more light will be transmitted to the film. Shutter Speed is how long the shutter stays open to let in light, also known as exposure.



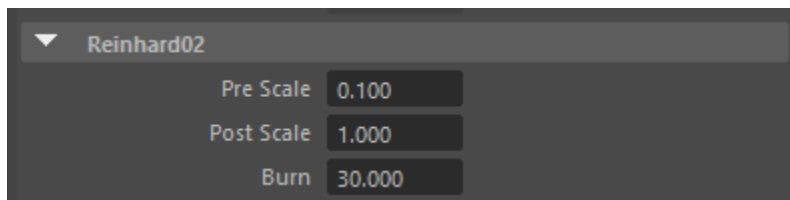
Reinhard02

This is aimed at adapting the high dynamic range of real world lighting to your screen.



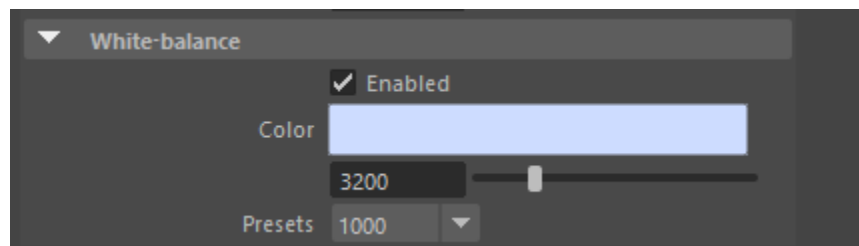
Note: It does this by letting you set values for Burn, Post Scale and Pre Scale. Pre Scale and Post Scale work together, this means that if you tweak one, you'll probably have to tweak the others.

Pre Scale controls the brightness of darker areas (i.e. shadows). Post Scale controls the final brightness of the image and Burn is used to tweak the brightness of highlights in your image based on its darker areas.



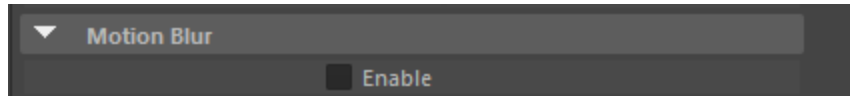
White-balance

White Balance follows the basic settings of a digital camera – lets you set the color temperature of the light in the image.



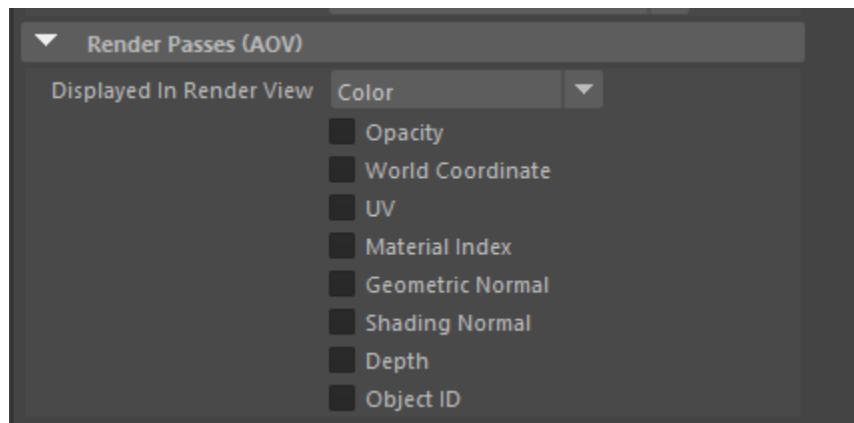
Motion Blur

AMD Radeon ProRender's Motion Blur will make object appear as if it's in motion, in stills as well as animations.



Render Passes (AOV)

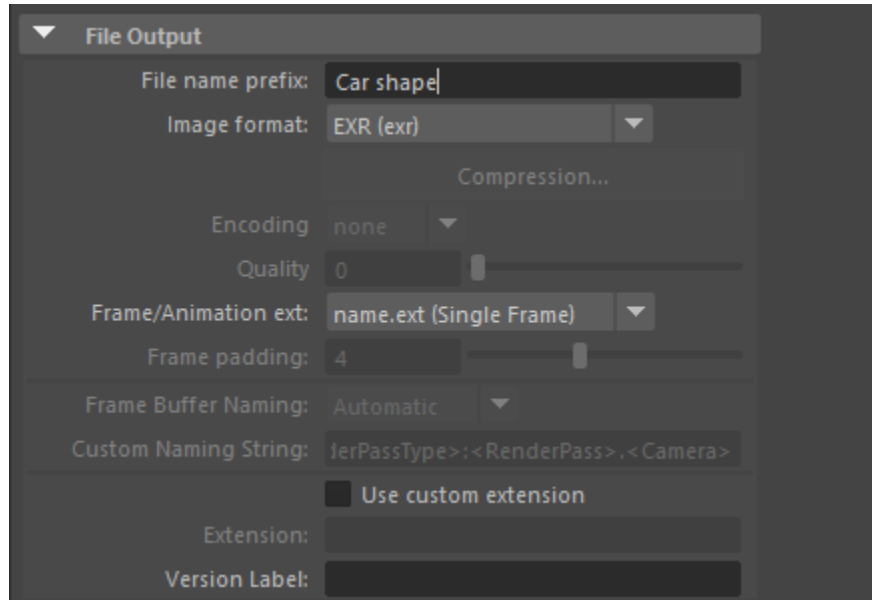
We are also able to create render passes that can be saved into a single EXR file. This can be done by firstly checking all the render passes you would like to render in the Render passes tab in your render settings.



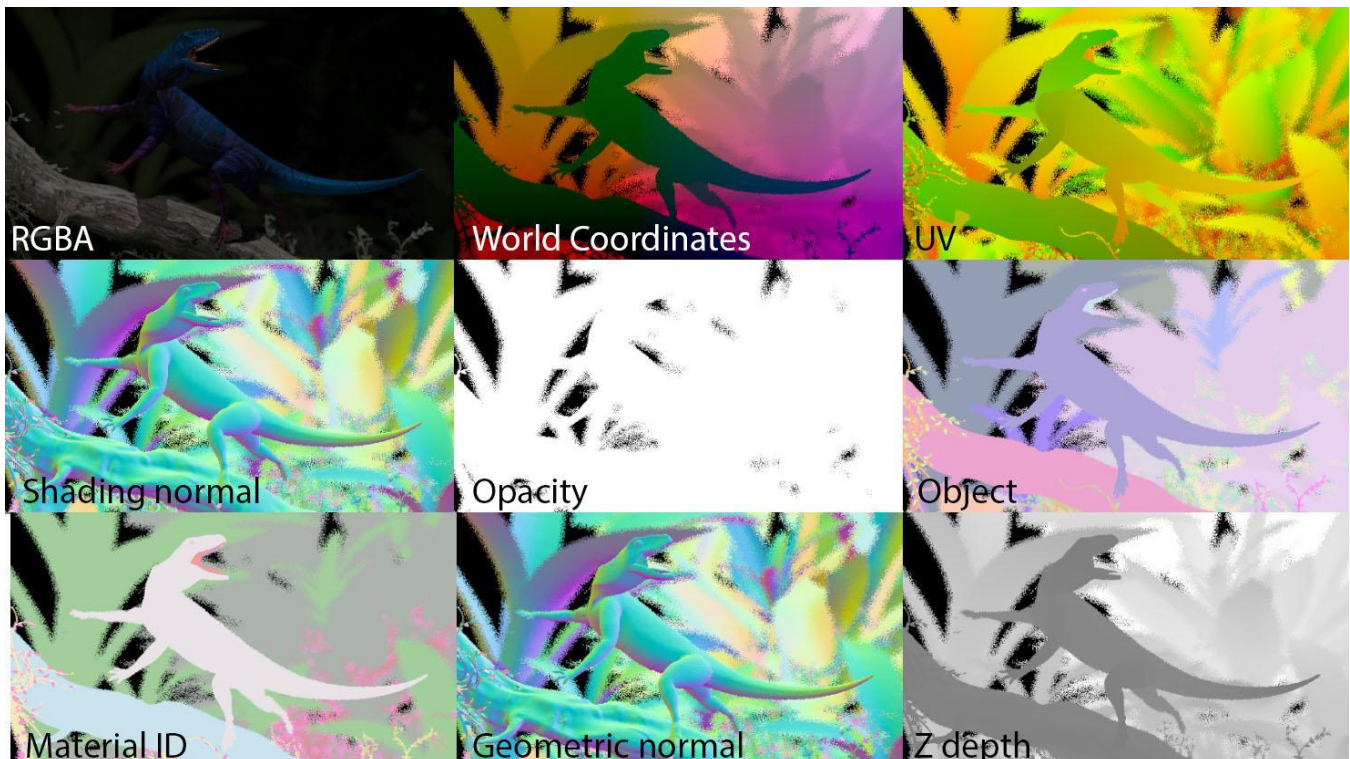
To render a pass through your render viewer or AMD Radeon ProRender viewport you will need to select the render pass in the **Displayed in Render View** dropdown menu.

For you to render the output file as an EXR file You will need to follow these steps.

1. Make sure your Project is set correctly.
2. In the render settings, common section locate the file output tab. Give your output file a name by typing it into the **File name prefix** box.
3. In the **Image format** dropdown menu select EXR as the file type.



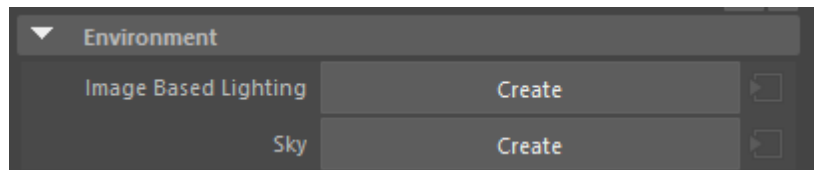
Initiate a render and once it finishes open it in any image editing software. You will notice that the EXR file when opened contains multiple layers for all the render passes you have selected.



Working with Lights

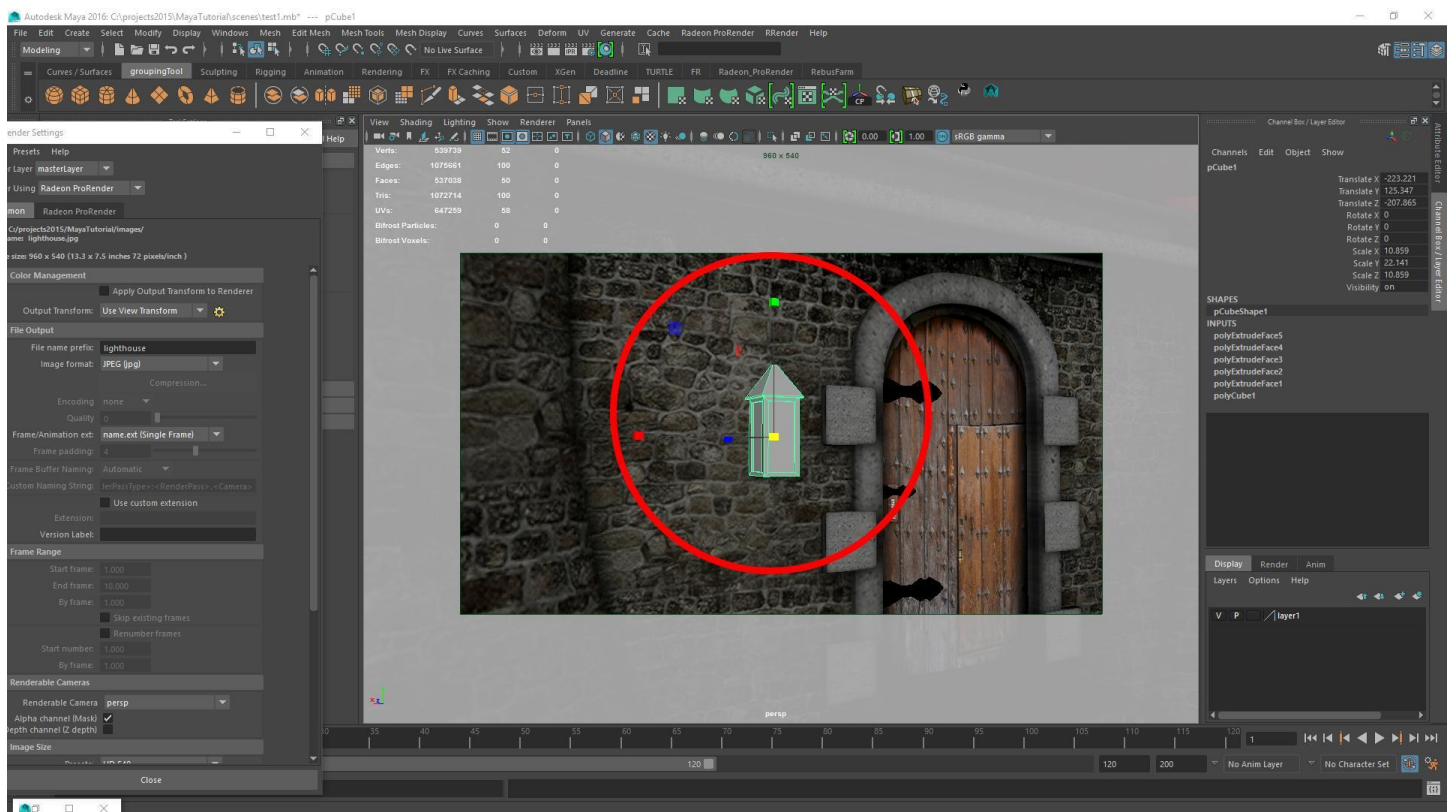
Initial Lighting of a Scene

Go to your **Render Settings** window, select the **AMD Radeon ProRender** tab and navigate to the **Environment** dropdown section. In the **Environment** dropdown click on the **Create** button next to **Image Based Lighting**. This will provide lighting of the scene reflective of the surrounding environment.

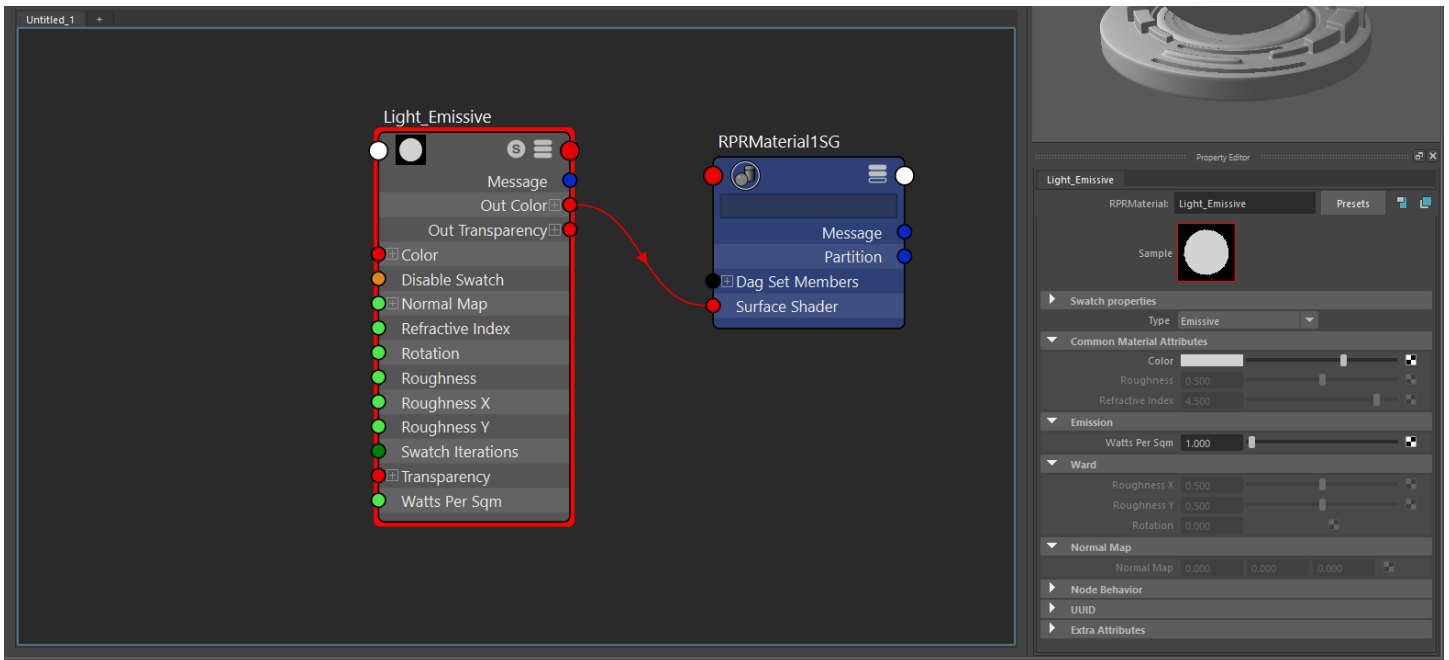


Emissive Material Lights

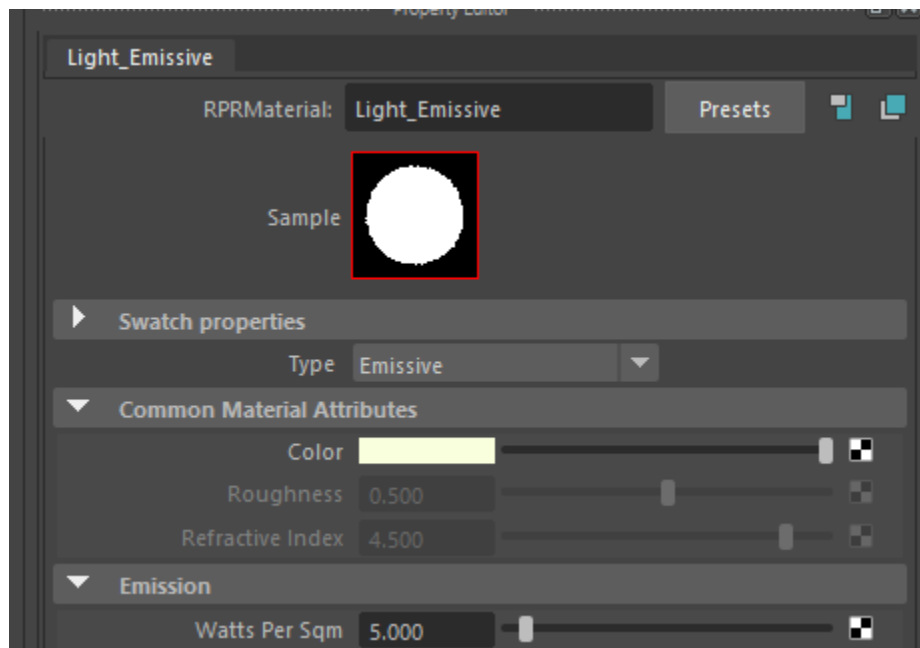
With AMD Radeon ProRender, we can also use objects as lights by applying an Emissive material to any 3d object in the scene. We will be adding an emissive material to a lantern shape in the scene.



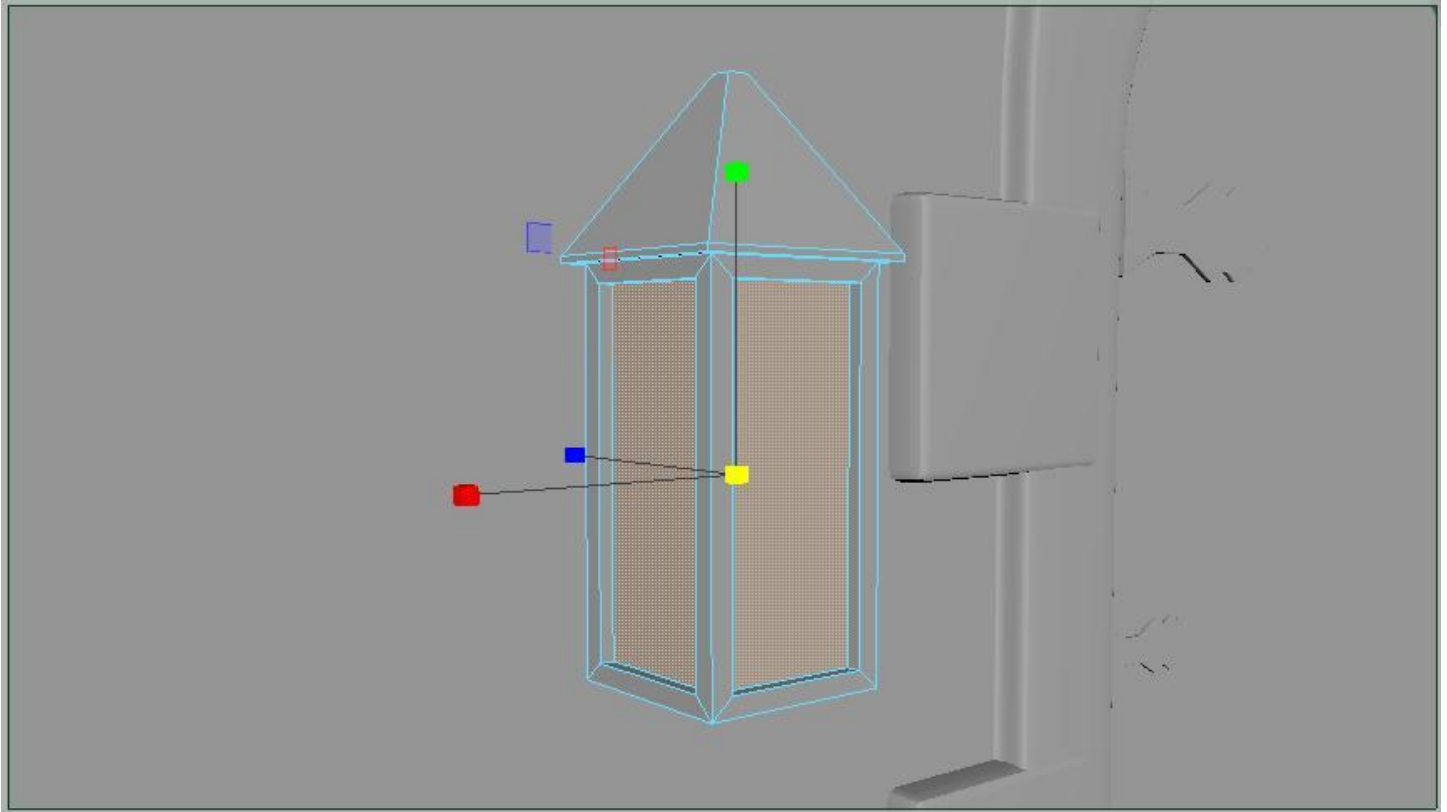
Go to your **Hypershade Editor** and from the AMD Radeon ProRender materials create an **RPRMaterial**. You can rename and change it from **Diffuse** to **Emissive** from the **Type** dropdown.



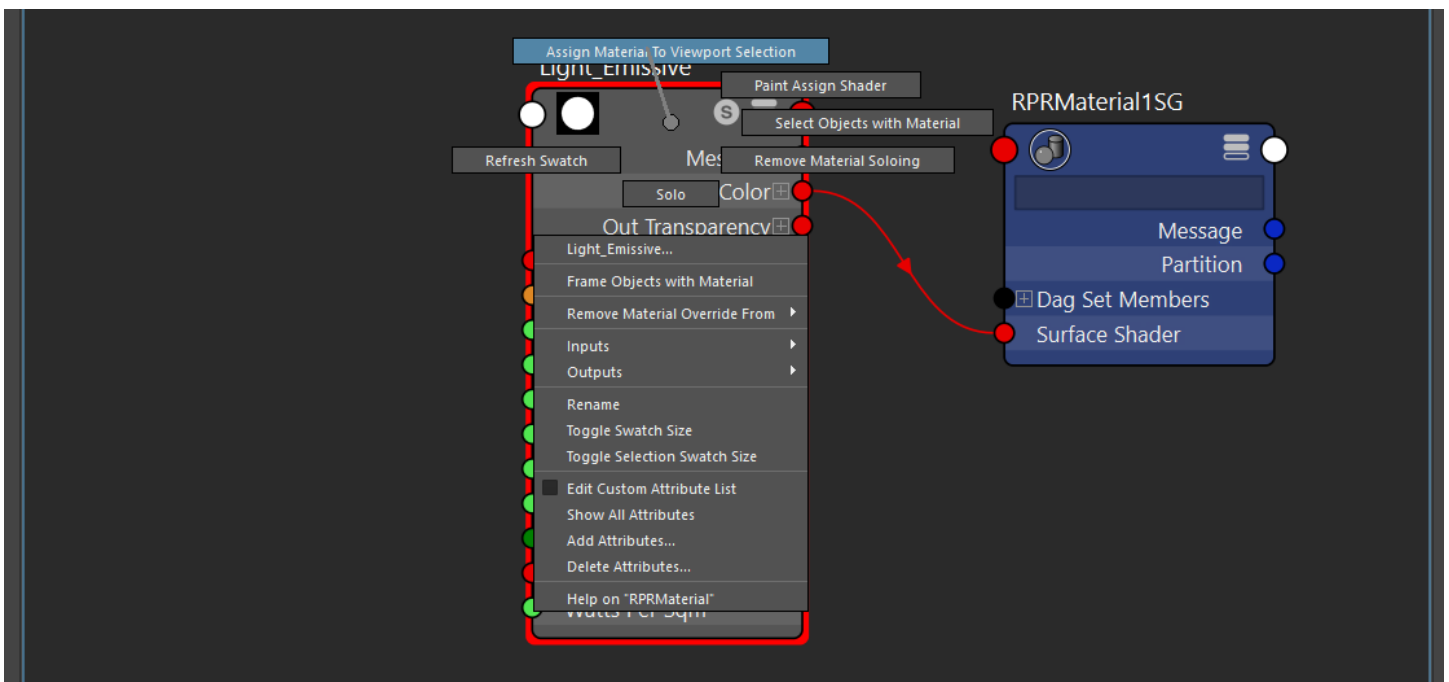
In the emissive materials properties, under the emission section, you can change the color and the watts per sqm (brightness) of the light. Set your **Emission** to 5 and your color to a slightly yellow white color.



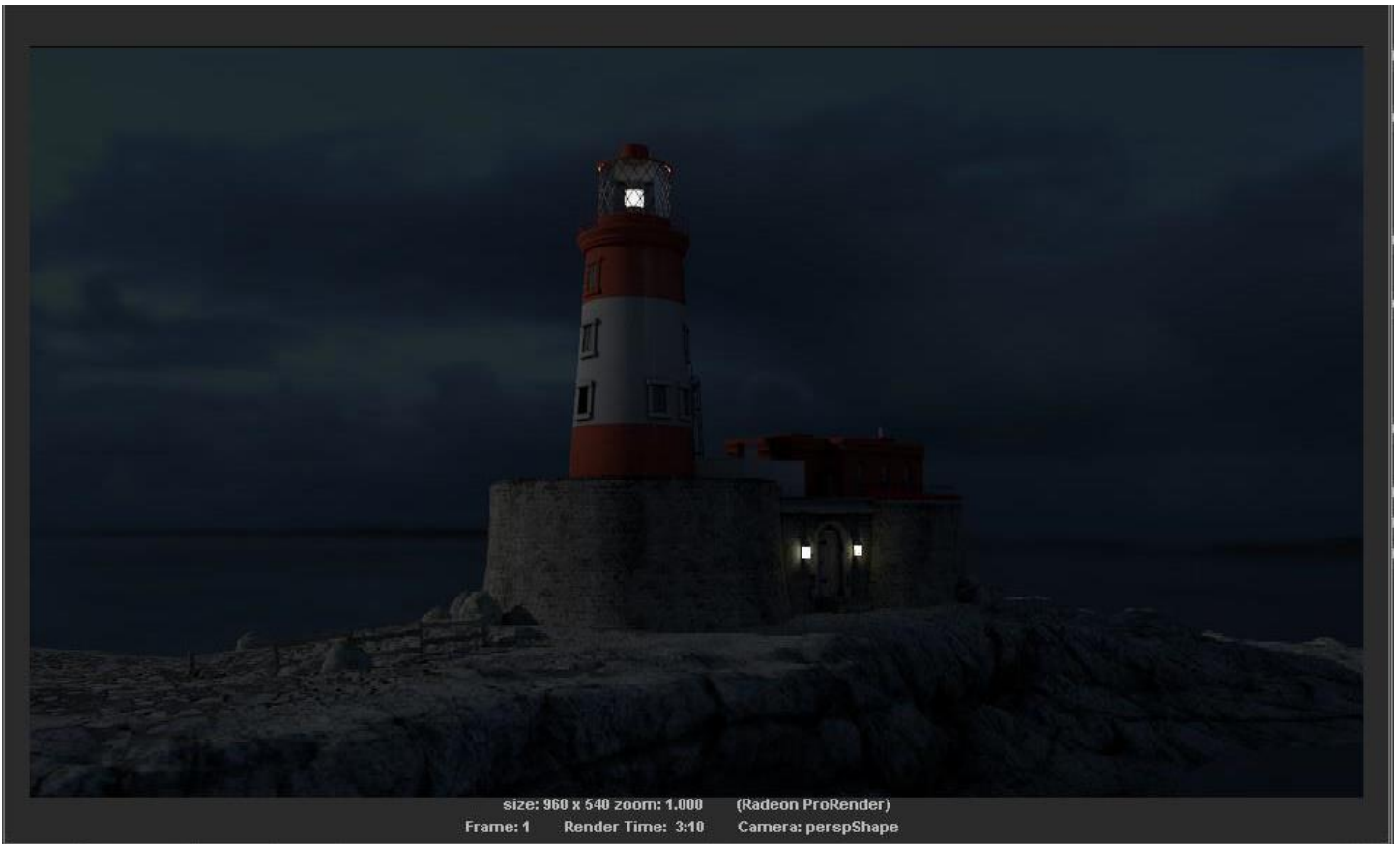
Select your geometry to apply the material. We will be applying the material to certain faces on the lantern.



Then right click and hold over your **light Emissive** material in the Hypershade and select **Assign Material to Viewport Selection**.

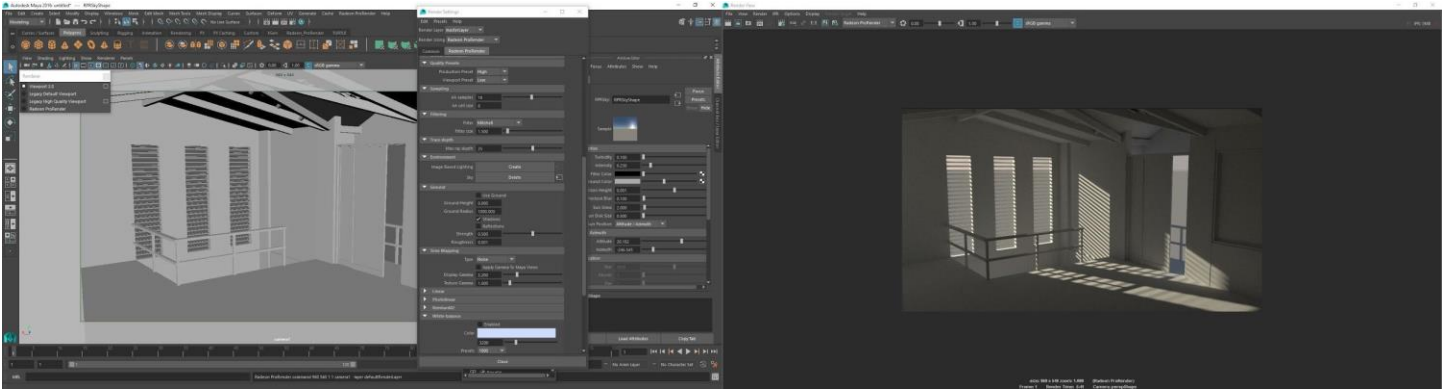


The rendered image will not have emissive lights

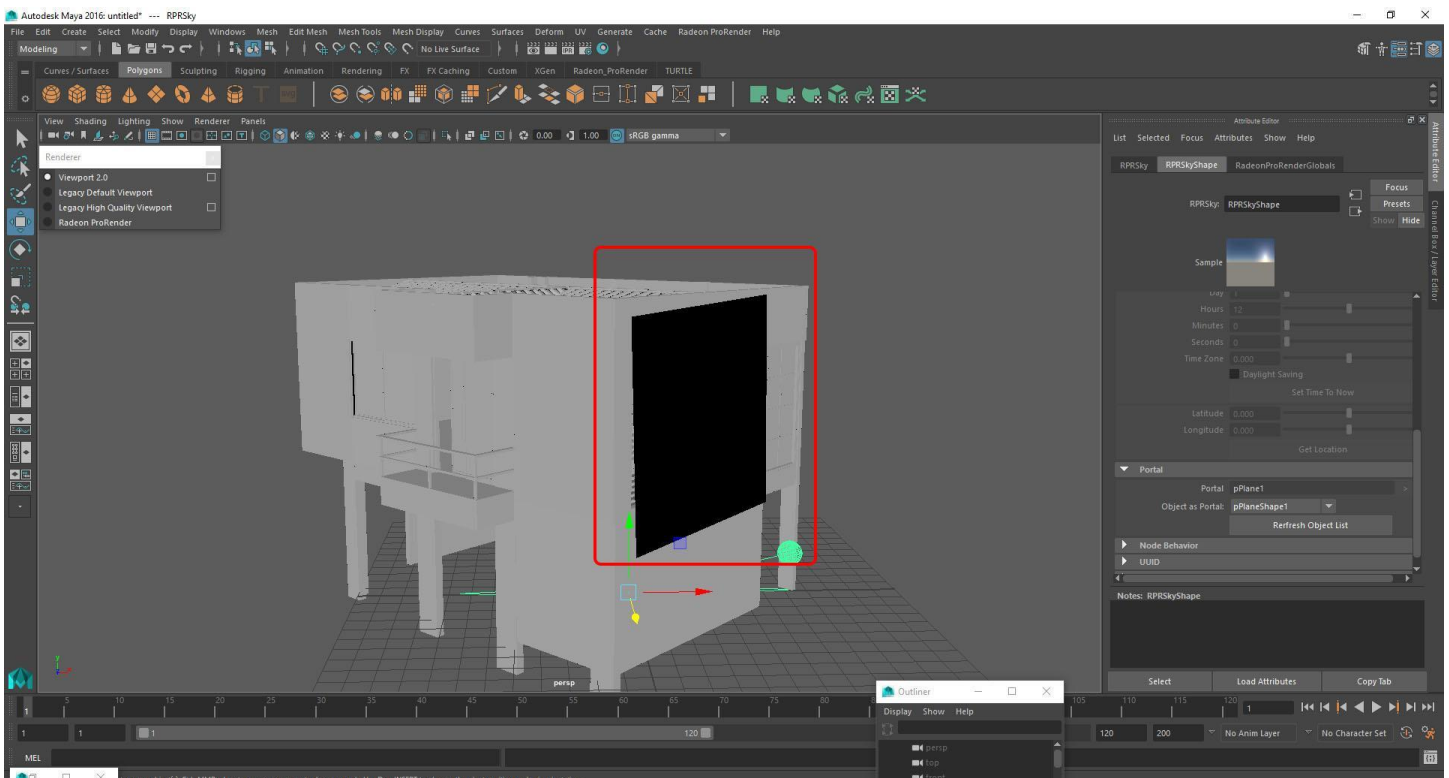


Portals

Portals are used to limit the amount of light being cast in scene. Using portals allows a user to allocate an exact point from where the light should come from when using a IBL or Sky instead of casting light over the entire scene. This is only useful when lighting interior scenes.



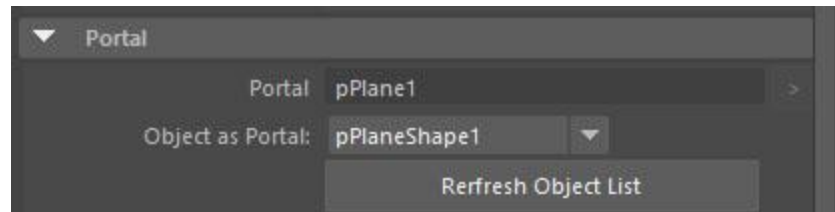
Here we have an interior scene that is being lit by using the Sky. You can see that the light is being cast through all the windows.



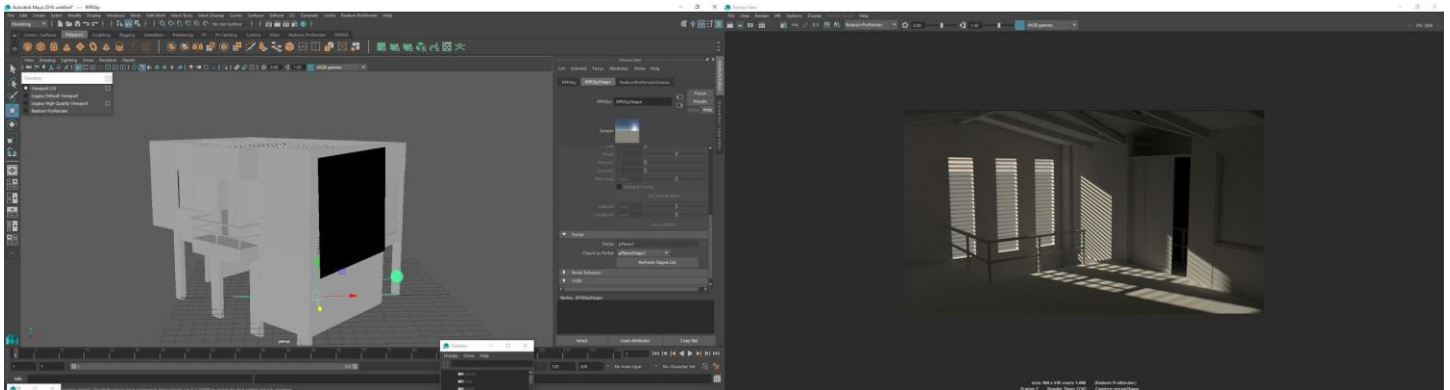
To activate the portals, create a Plane and place it in front of your windows.

Select the sky widget from the viewport or from the outliner. Navigate to the Sky attributes panel on the right hand side and locate the **Portals** dropdown. We can then select the **Object As Portal** dropdown and

find the pPlane1 object we created. Make this your portal. If it is not in your list hit the **Refresh Objects List** button.



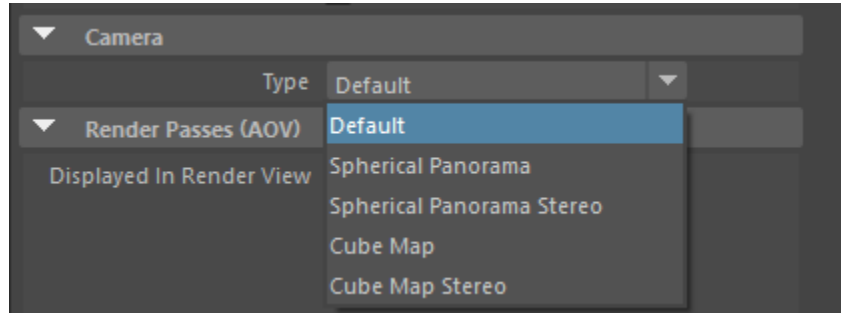
Hit render and you will notice that the light is now only being cast from the plane instead of the entire scene.



This feature will increase rendering performance.

Working with Cameras

When working with cameras We have a couple options to choose from. The options can be found in **Render Settings** under the Camera section.



When the camera type is set to default, it will render out the usual flat image to the resolution you set in your render settings. This is what you will probably use the most when rendering.

Default



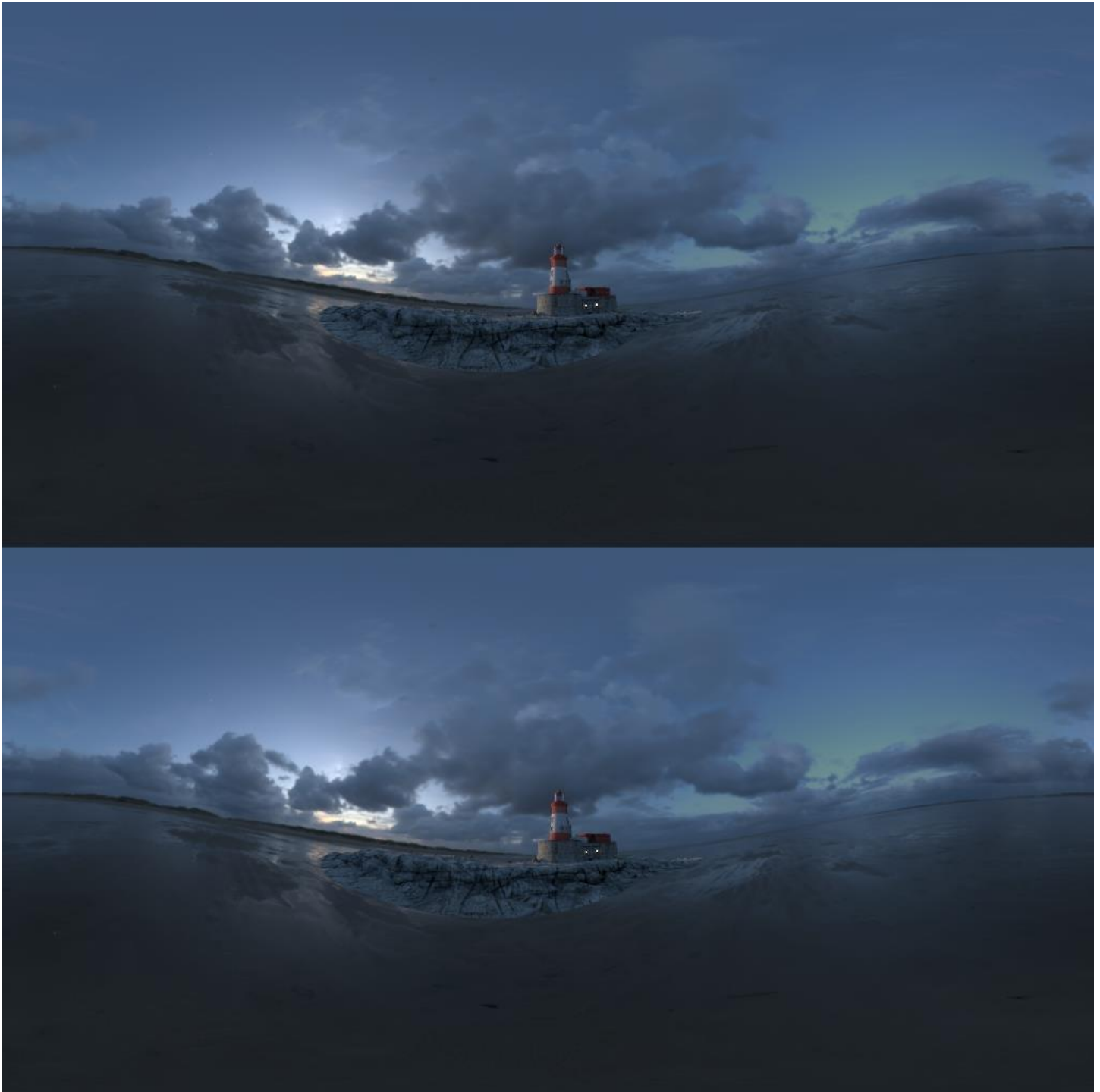
Spherical Panorama

Spherical Panorama will render a 360-degree image that wraps around your scene. This can be used to create a 360 video of your scene that can be uploaded to YouTube and viewed. **Sphere mapping** (or **spherical environment mapping**) is a type of reflection mapping that approximates reflective surfaces by considering the environment to be an infinitely far-away spherical wall. This environment is stored as a texture depicting what a mirrored sphere would look like if it were placed into the environment [1].



Spherical Panorama Stereo

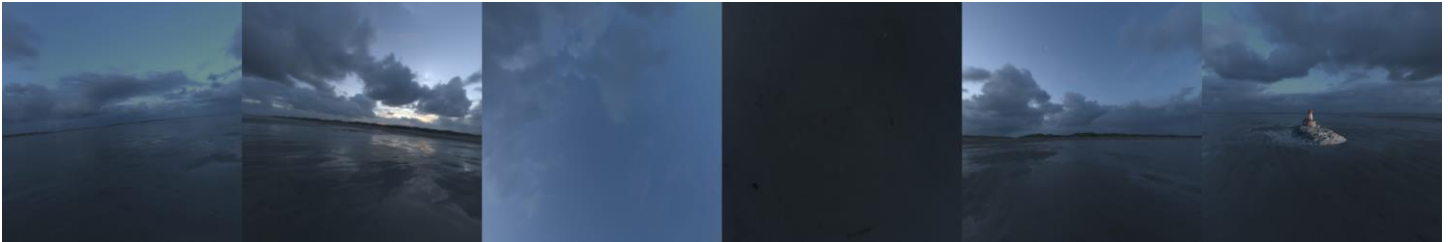
Spherical Panorama Stereo will be used to create 360 degree images to be used for VR. As you can see the Image is split in two and the reason for this is that it is rendering an image for both the Left and Right eye. Keep the aspect ratio to 1:1 for square pixels.



Cube Map

For cube mapping you will need to times your resolution width by 6 to get square pixels e.g: 1k res = 6144 x 1024

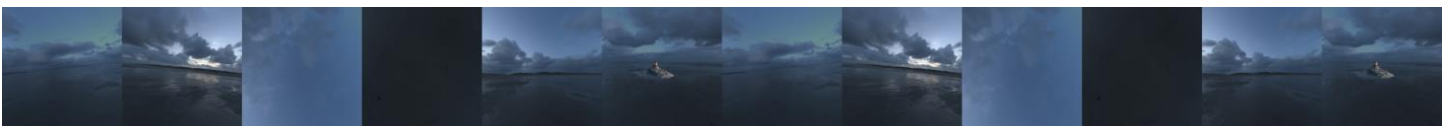
Cube Mapping is a method of environment mapping that uses the six faces of a cube as the map shape. The environment is projected onto the sides of a cube and stored as six square textures, or unfolded into six regions of a single texture.




In most cases, cube mapping is preferred over the older method of sphere mapping because it eliminates many of the problems that are inherent in sphere mapping such as image distortion, viewpoint dependency, and computational inefficiency. Also, cube mapping provides a much larger capacity to support real-time rendering of reflections relative to sphere mapping because the combination of inefficiency and viewpoint dependency severely limit the ability of sphere mapping to be applied when there is a consistently changing viewpoint.

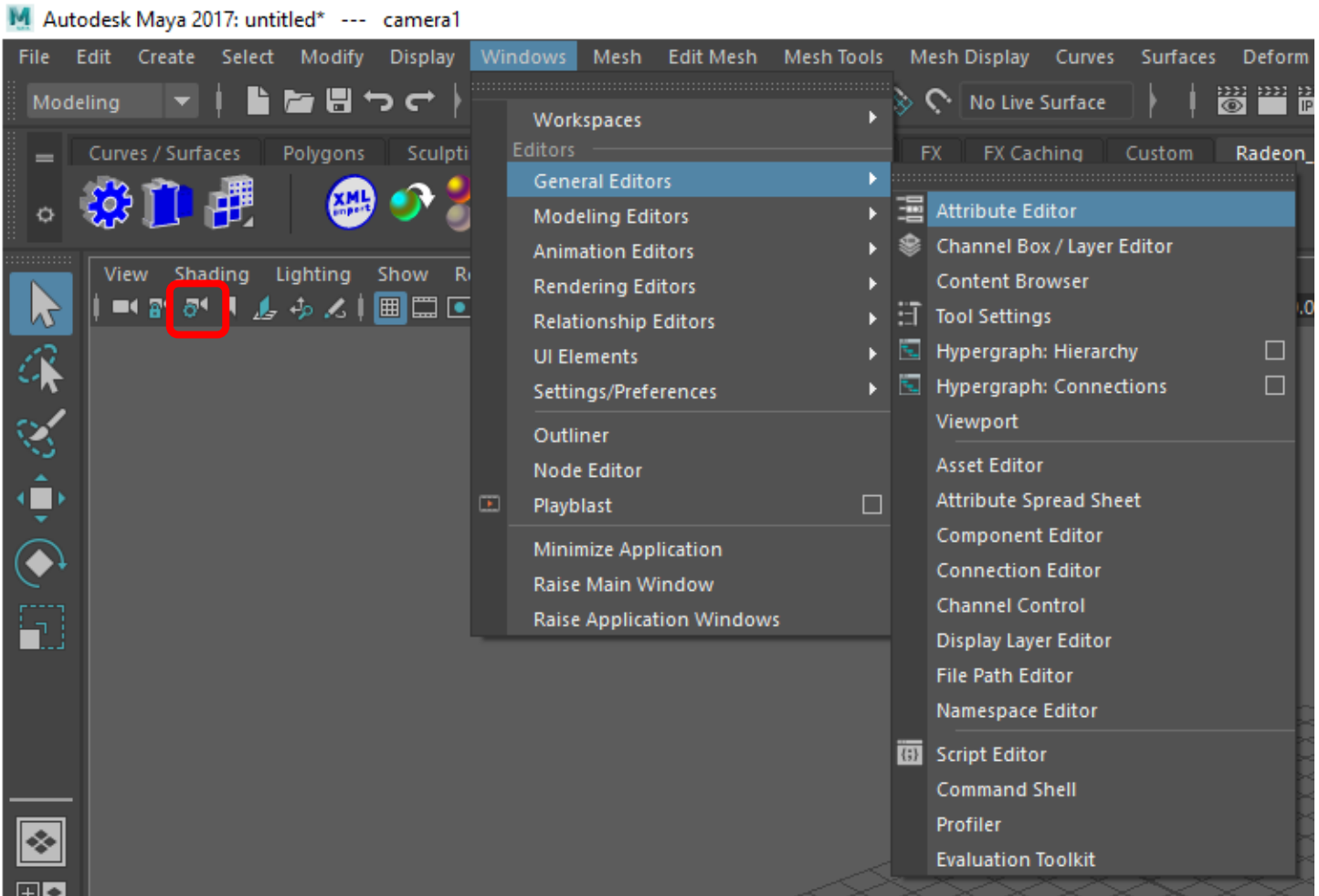
Cube Map Stereo

This is pretty much the same as cube mapping except that it splits the render into 12 blocks, 6 for the Left eye and 6 for the Right. This is for VR. You will need to times your resolution width by 12 to get square pixels. 1k res = 12288 x 1024.

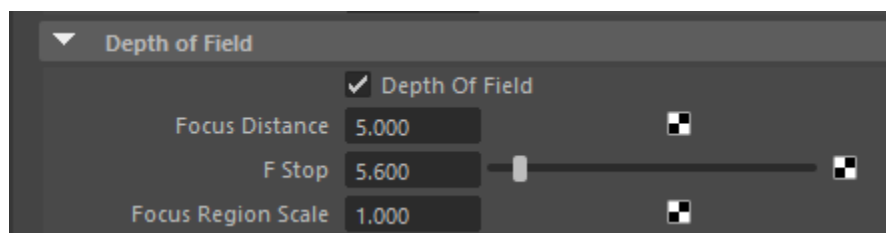


Depth of Field

With your camera selected, go to the Attribute Editor by clicking **Windows > General Editors > Attribute Editor** or by clicking the Camera attribute  button.



Locate Depth of Field. Check the box to enable DOF.



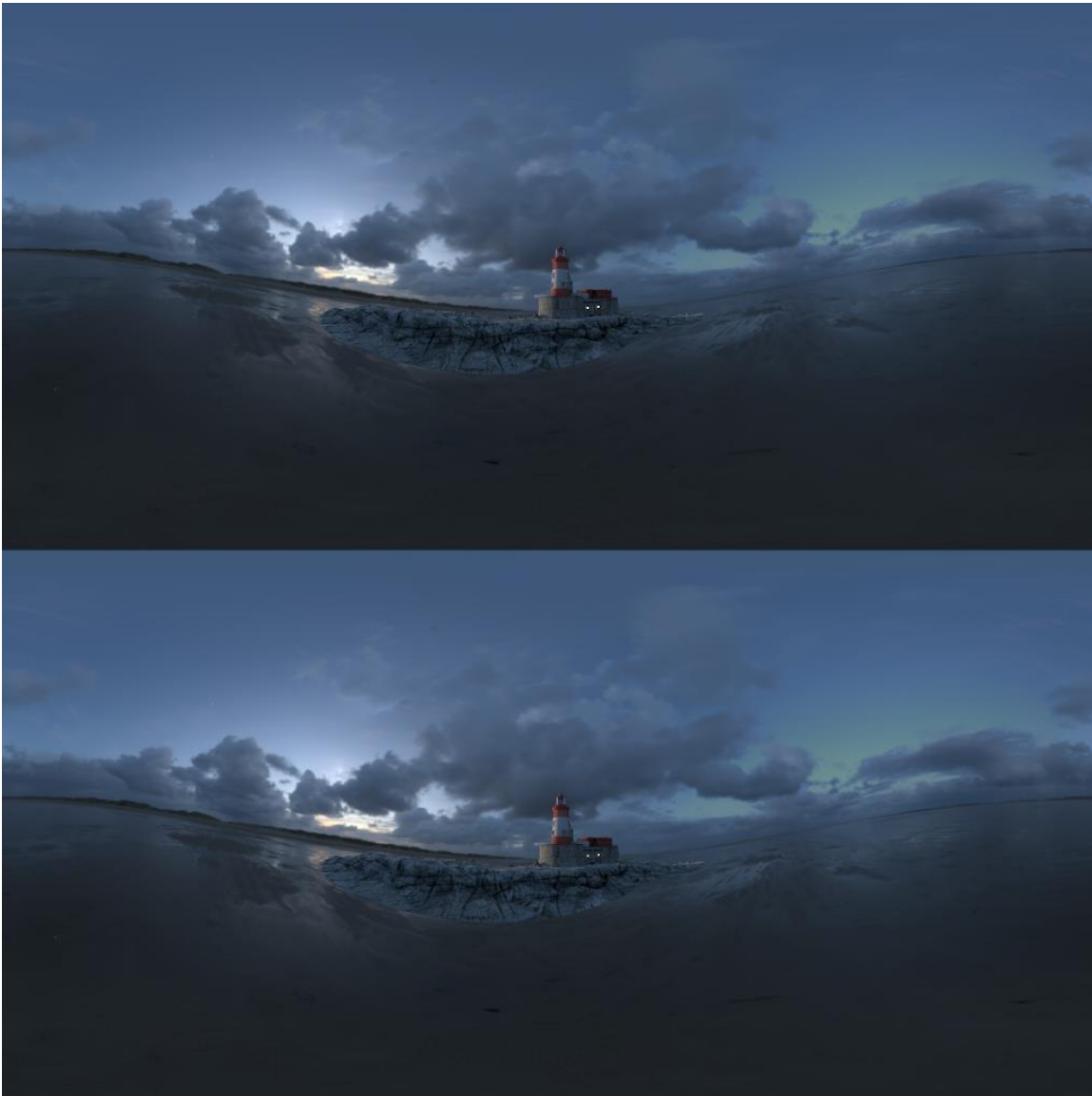
Set in your focus distance to determine how far you want your camera to focus from the lens to the object. F-stop will determine how much blur will be added to the render. The higher the value the less amount of blur you will see.

VR Cameras

When working with cameras, there are a couple options to choose from. The options can be found in Render Settings under the Camera section.

When the camera type is set to default, it will render out the usual flat image to the resolution you set in your render settings. This is what you will probably use the most when rendering. The Spherical Panorama Stereo camera type provides you with a 360-degree split (over and under) stereoscopic image (one part for each eye) output suitable for viewing through VR devices.

Spherical Panorama Stereo will be used to create 360-degree images to be used for VR. As you can see the image is split in two and the reason for this is that it is rendering an image for both the Left and Right eye. Keep the aspect ratio to 1:1 for square pixels.

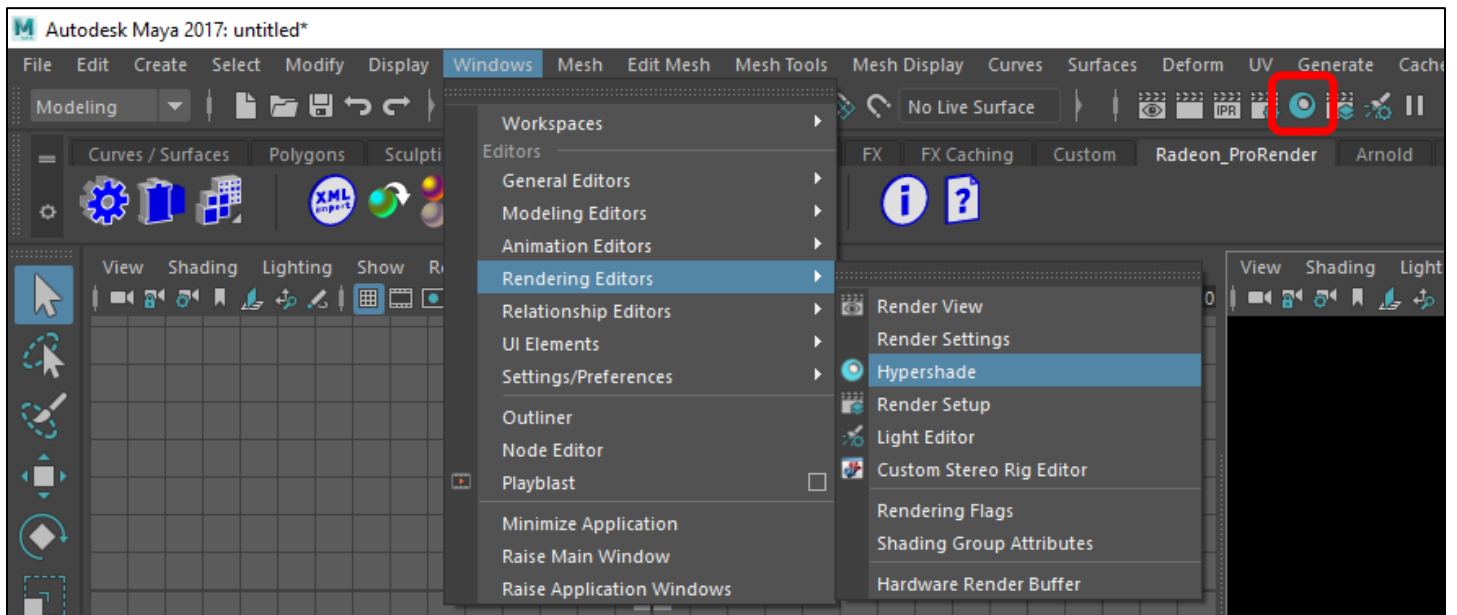


Working with Materials

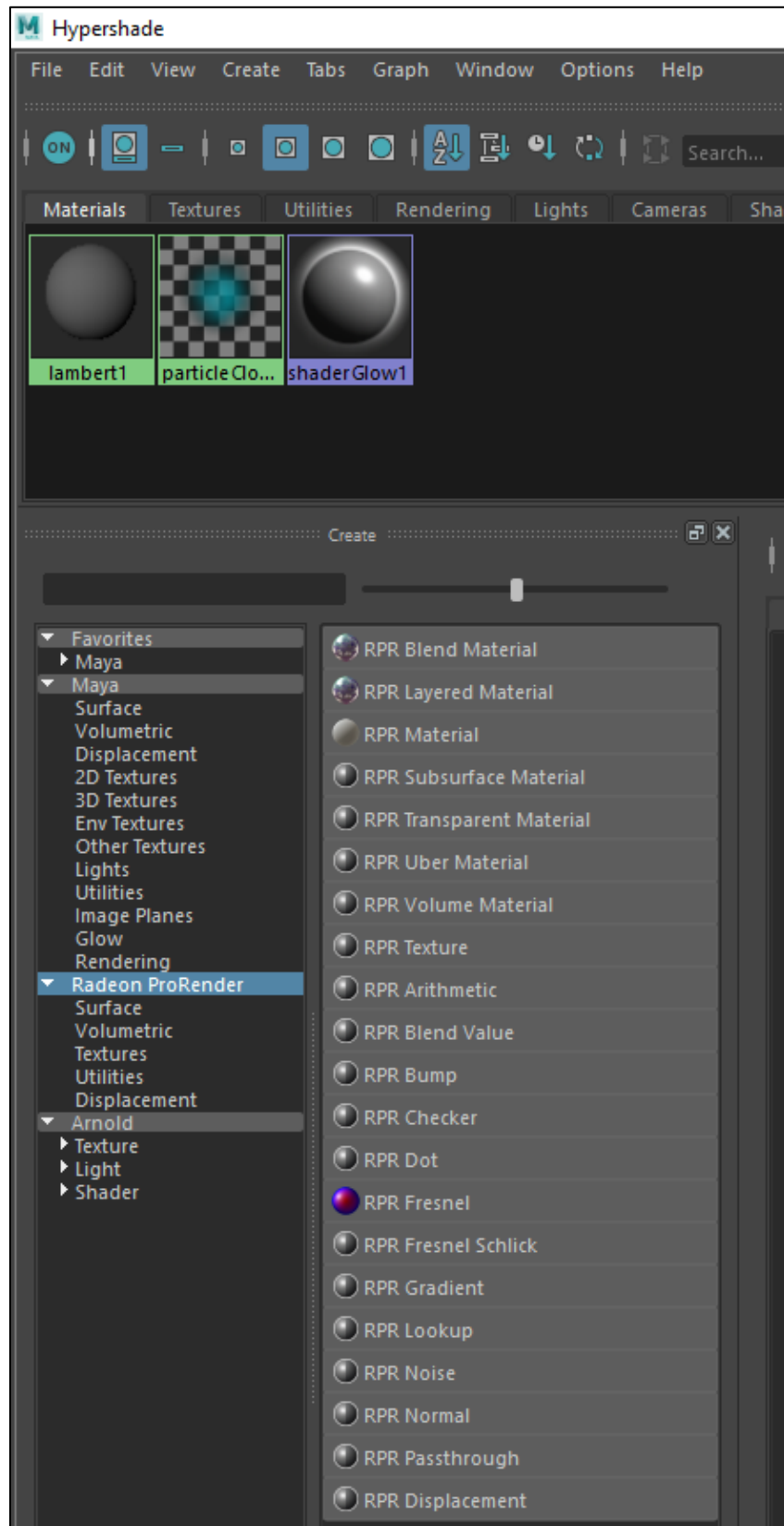
Included within the AMD Radeon ProRender install is the addition of AMD Radeon ProRender materials to the Maya material library for you to use.

Display the Material Library

Click on the **Hypershade Button** in the AMD Radeon ProRender shelf or use the **Hypershade Button** next to the Render Settings button.



Once the **Hypershade Editor** window is open, navigate to the AMD Radeon ProRender materials and select an **RPR Material**. And middle click and drag it onto your object in the viewport.



AMD Radeon ProRender Material Library

AMD Radeon ProRender Materials Breakdown:

MATERIALS	DESCRIPTION
RPR BLEND	used to blend 2 or more materials together
RPR LAYERED	
RPR MATERIAL	
RPR SUBSURFACE	used for surfaces that does not reflect light off the surface like a mirror or water, but penetrates it a little, like candles, milk, skin or fruit, like grapes
RPR TRANSPARENT	used to generate only transparency. Will be used with Blend material to make more advanced materials such as meshes and layered shaders
RPR UBER	combines several inputs to generate one big shader, alleviating the need to combine and group many shader-nodes together
RPR VOLUME	used for streetlights at night, fog or mist

The installer also adds the following Maps:

MAPS	DESCRIPTION
RPR TEXTURE	
RPR ARITHMETIC	
RPR BLEND VALUE	
RPR BUMP	
RPR CHECKER	
RPR DOT	
RPR FRESNEL	
RPR FESNEL-SCHLICK	
RPR GRADIENT	
RPR INPUT LOOKUP	
RPR NOISE	

RPR NORMAL

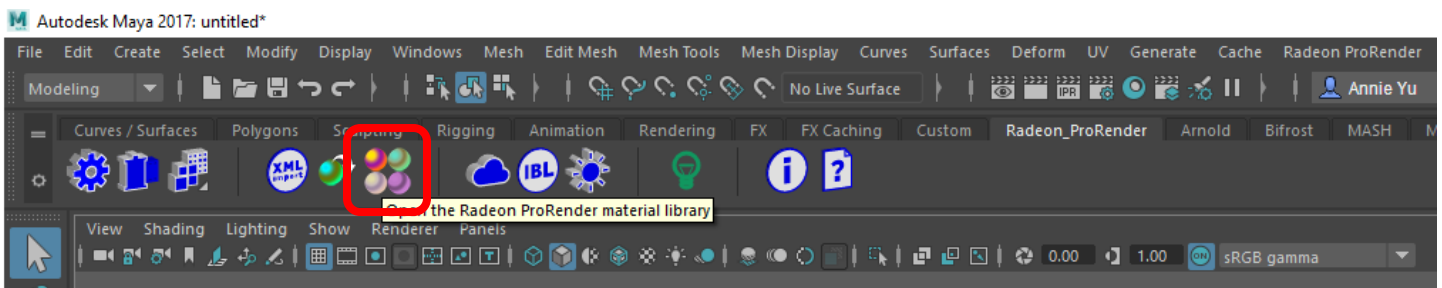
RPR PASSTHROUGH

RPR DISPLACEMENT

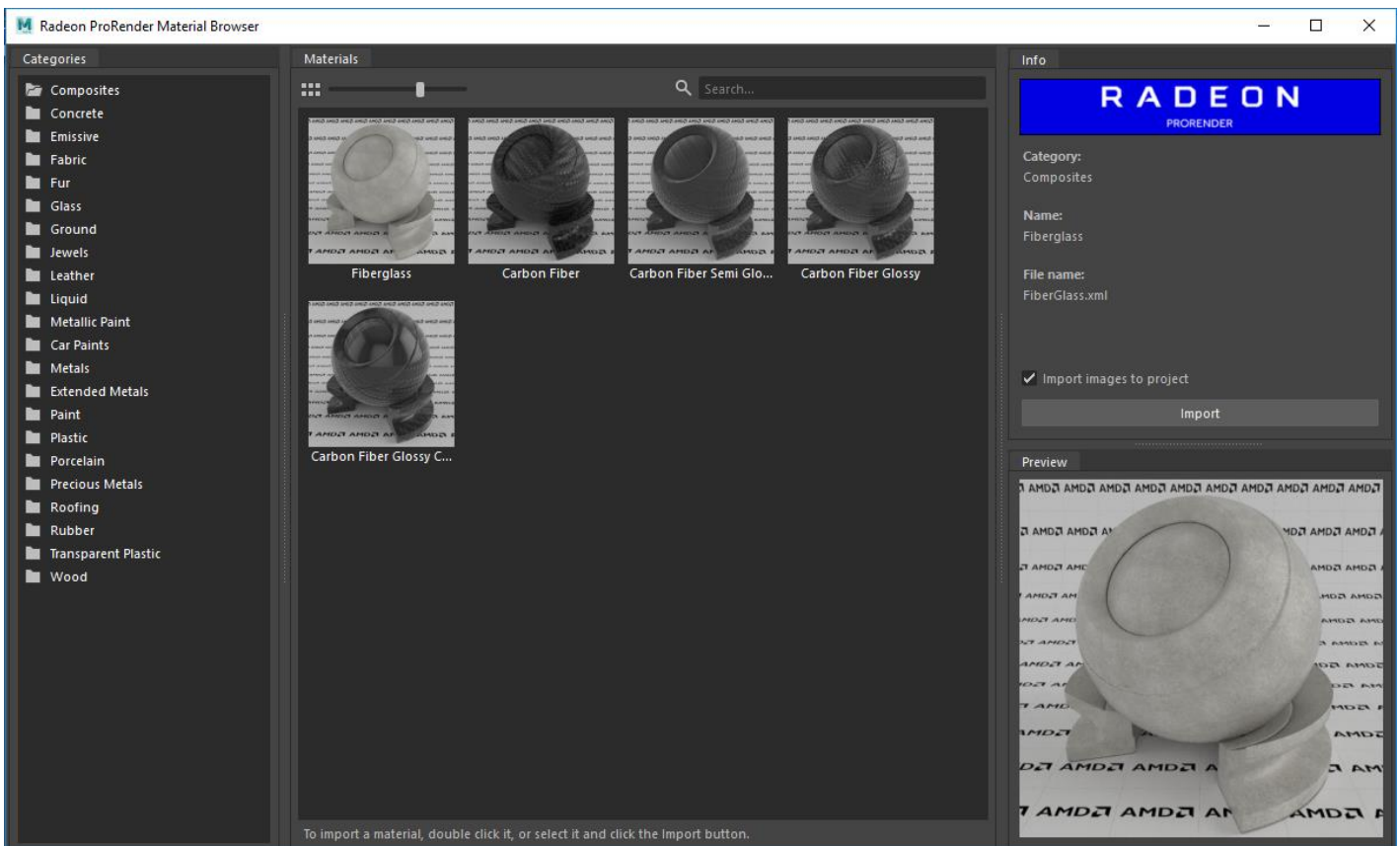
AMD Radeon ProRender Material Browser

The installer package adds complex materials that uses the materials above in conjunction with maps and node connections to create a large library of pre-configured materials for you to use.

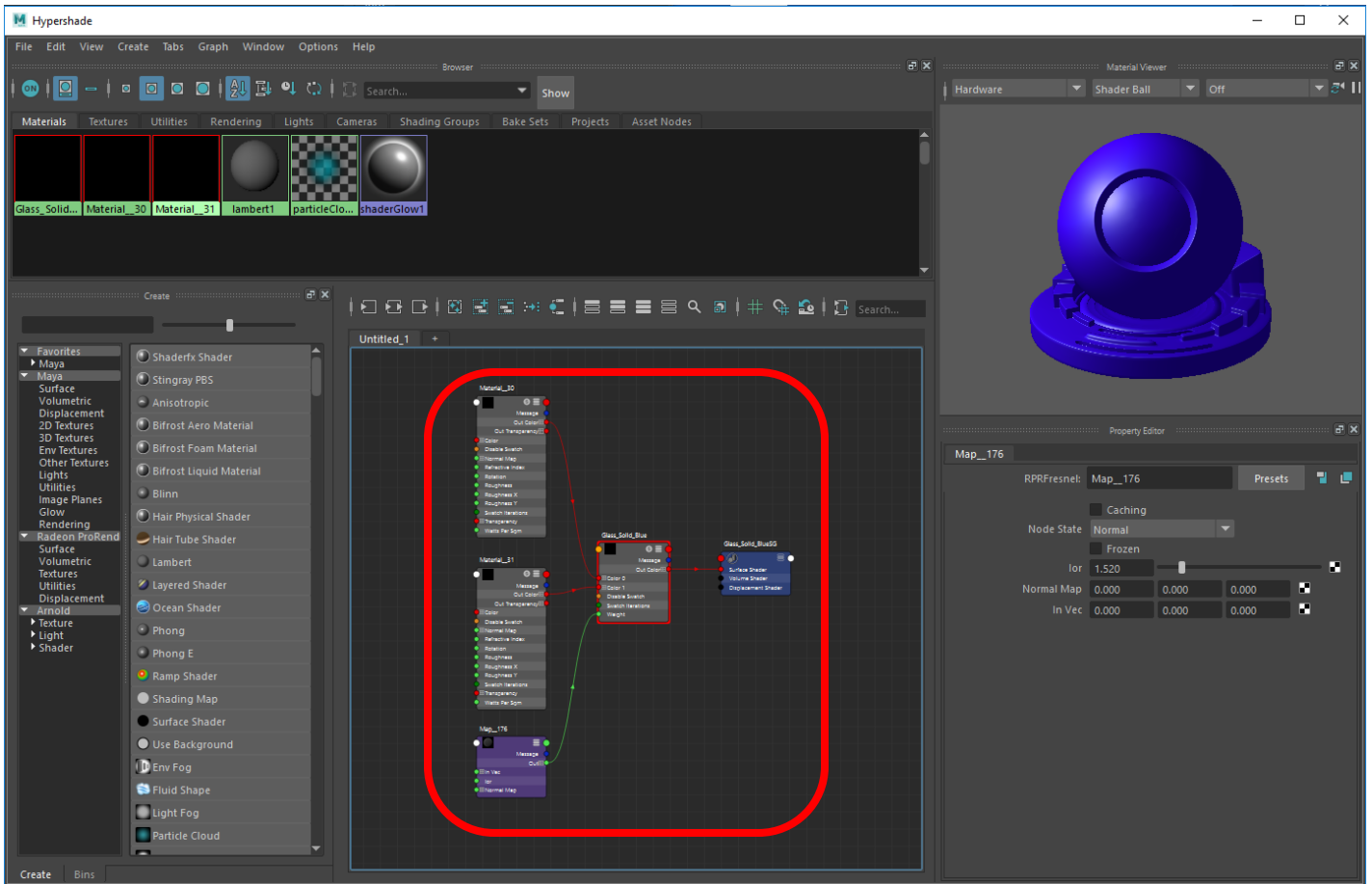
In the viewport, open the **AMD Radeon ProRender Material Library**.



Double click the material to import into the Hypershade.

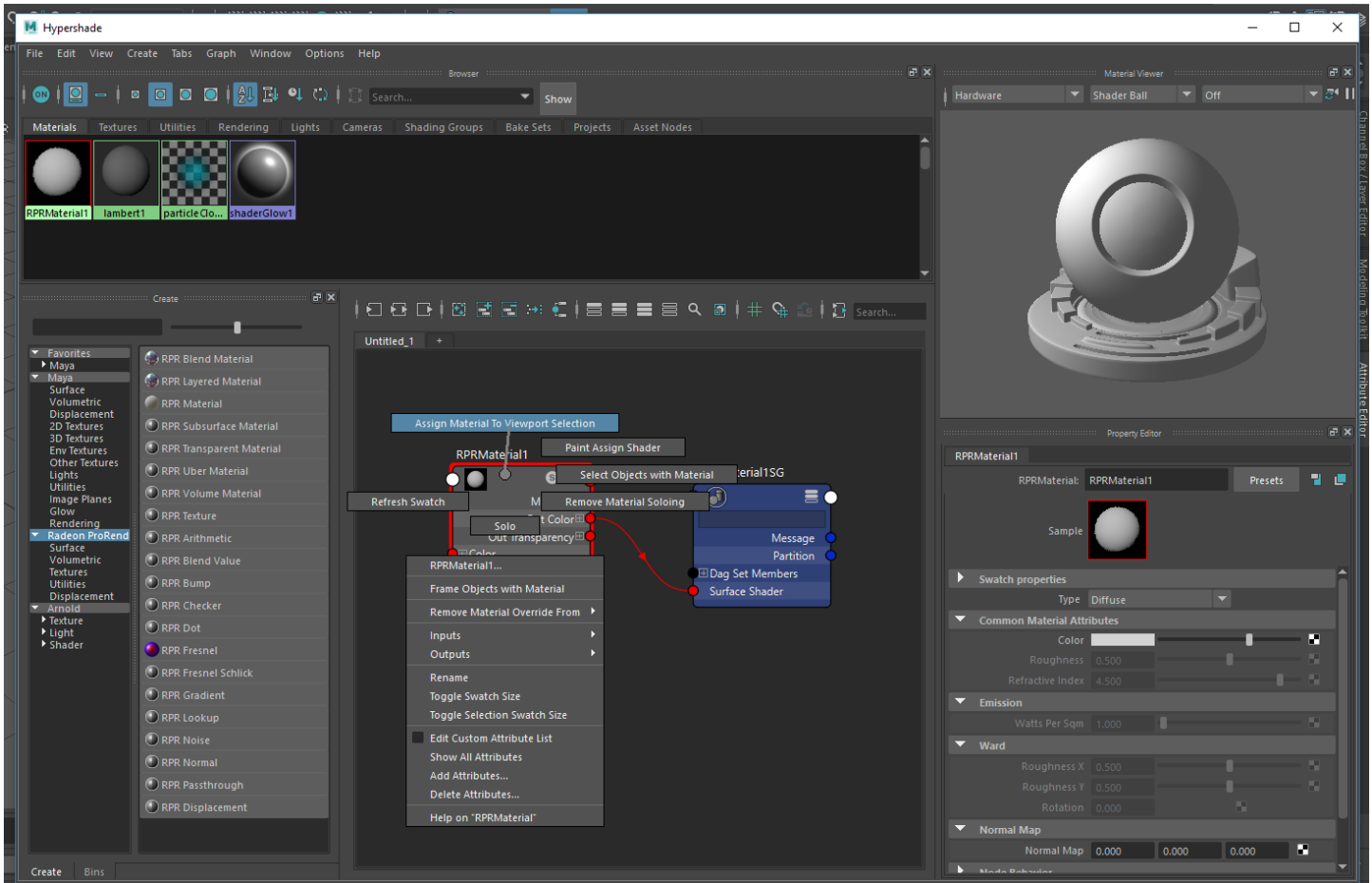


In the Hypershade, you will see the material, and various nodes used to create that particular material.

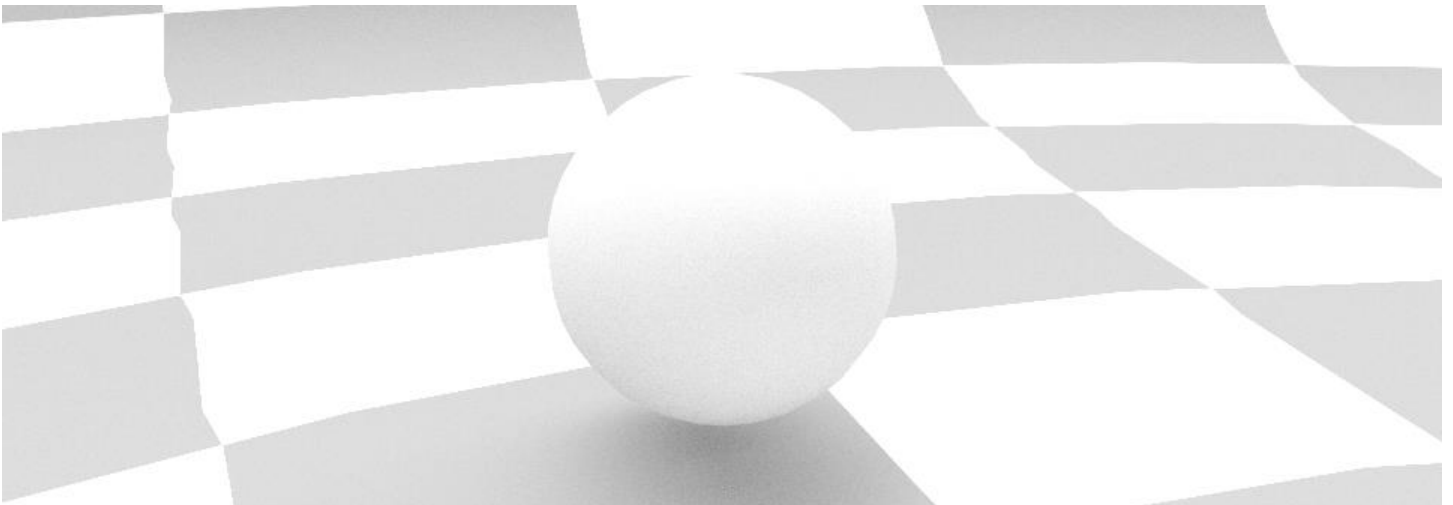


Assigning Basic Materials

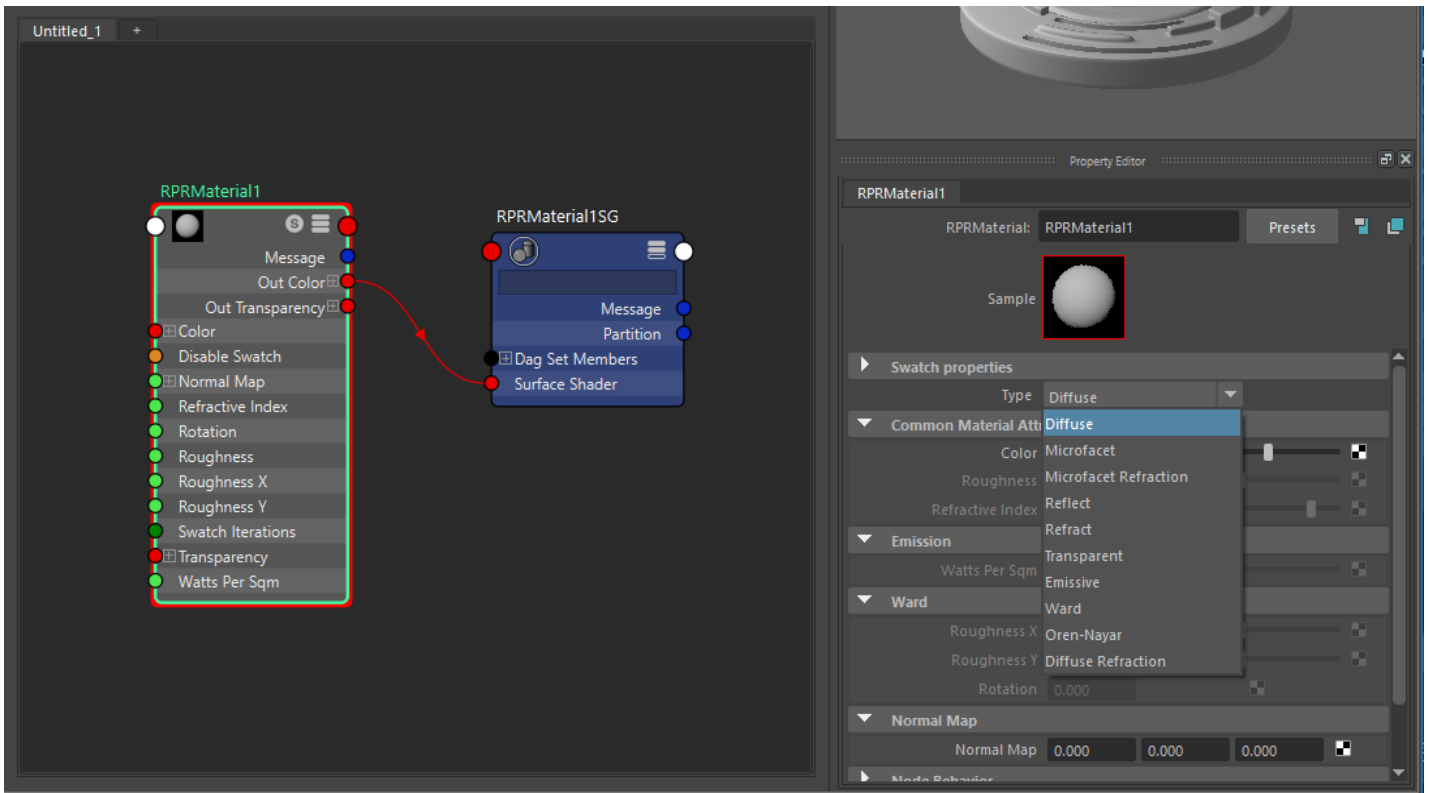
Click on the object in the viewport. Right click the material node in the **Hypershade Editor** and select **Assign Material to Viewport Selection**.



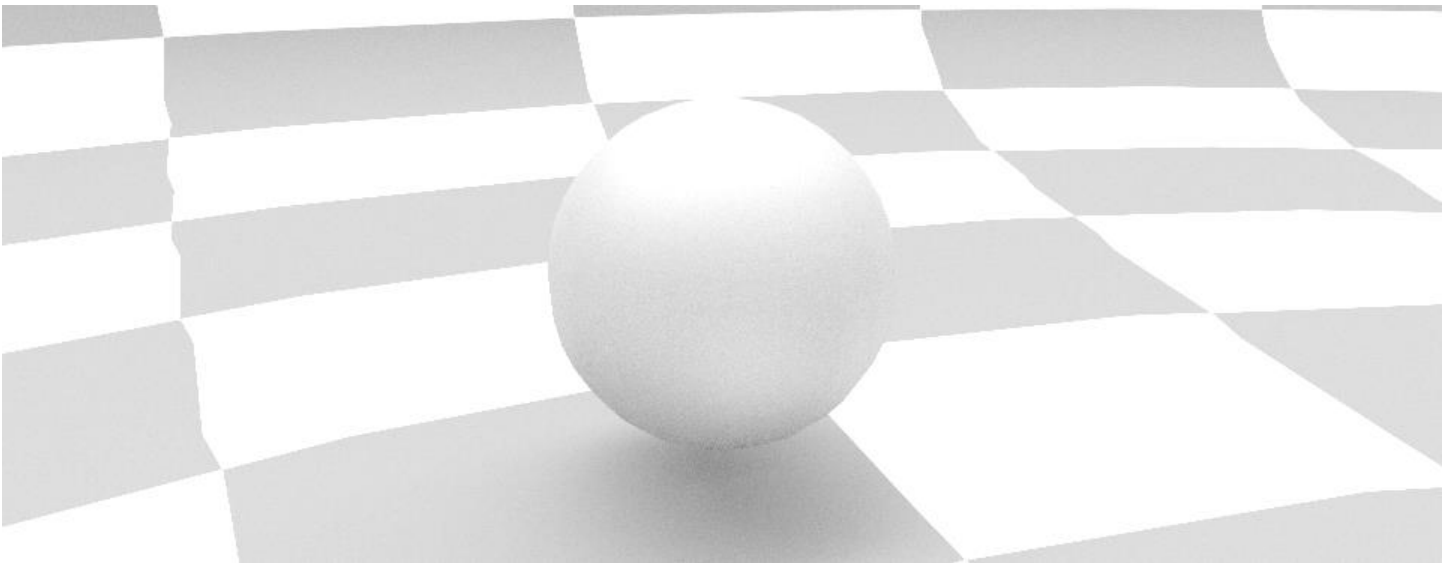
Assign a IBL to your render settings and do a test shader render. You will notice that the **RPRMaterial** is set by default to Diffuse which will give you a matte shaded finish.



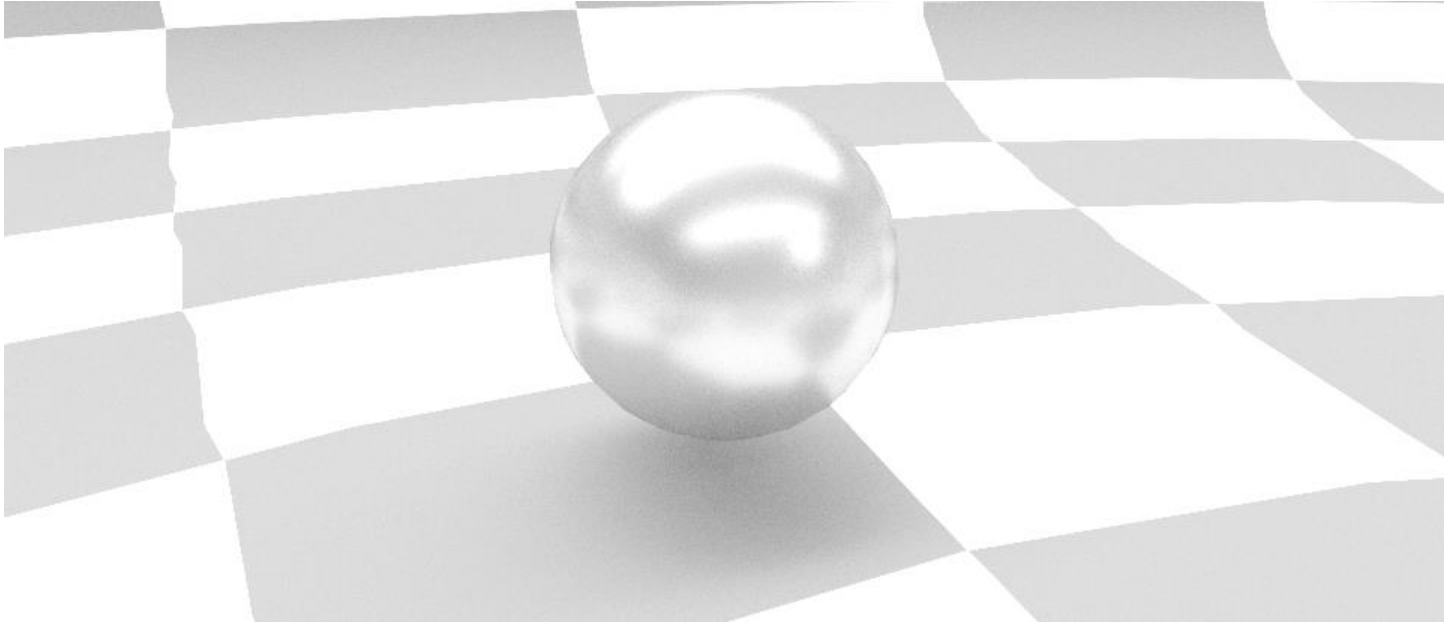
In the material attributes under **Swatch Properties > Type** you are able to switch between a range of different material types.



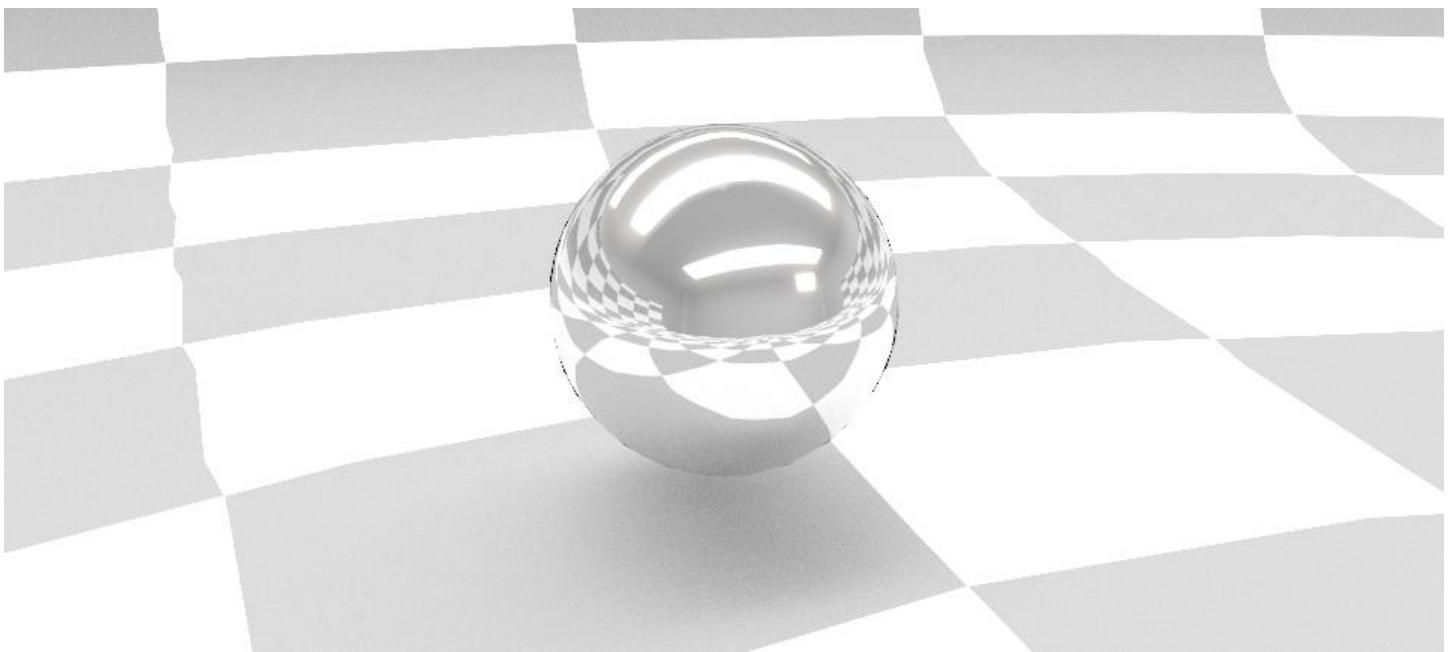
Change your material Type to **Microfacet**.



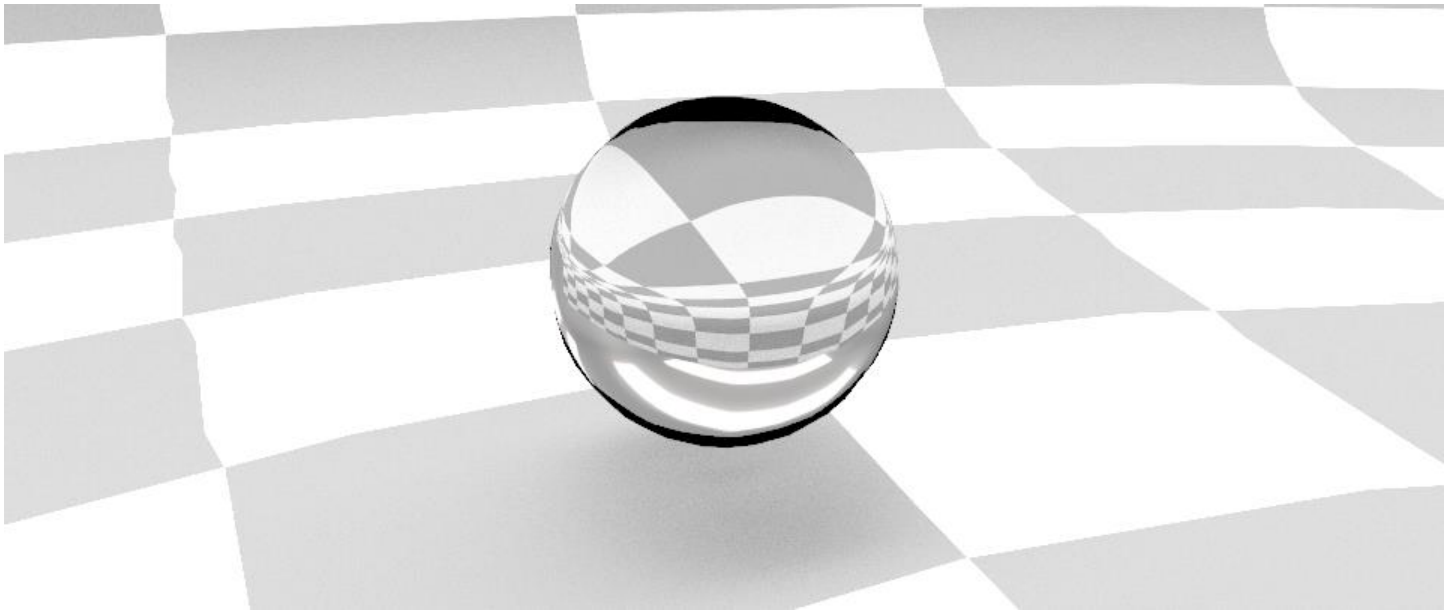
You will notice that in you AMD Radeon ProRender material attributes there are a couple more options that become available when changing the material type. We can change the roughness to make the material more shiny or we can change the index of refraction. Set your roughness to 0.1 to see the material with some reflectivity.



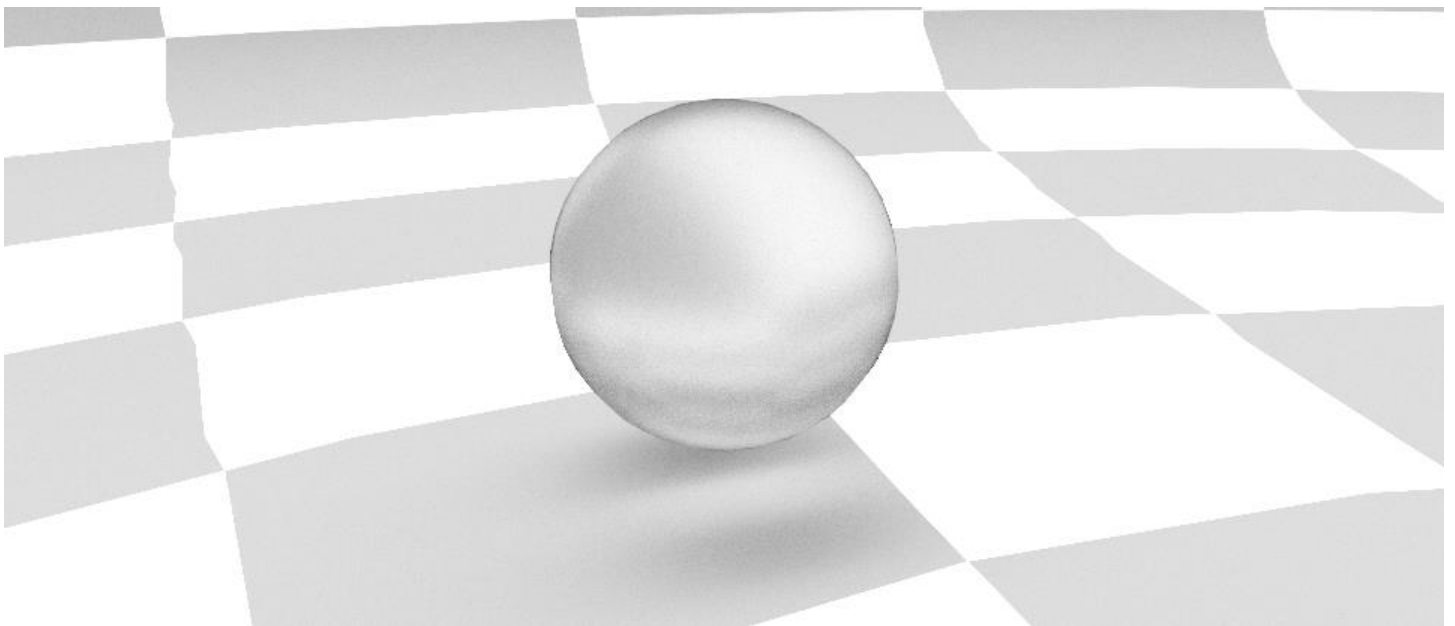
Material type set to **Reflect**, this will only give you the raw reflection of the scene and will most likely be used in a **blend material**:



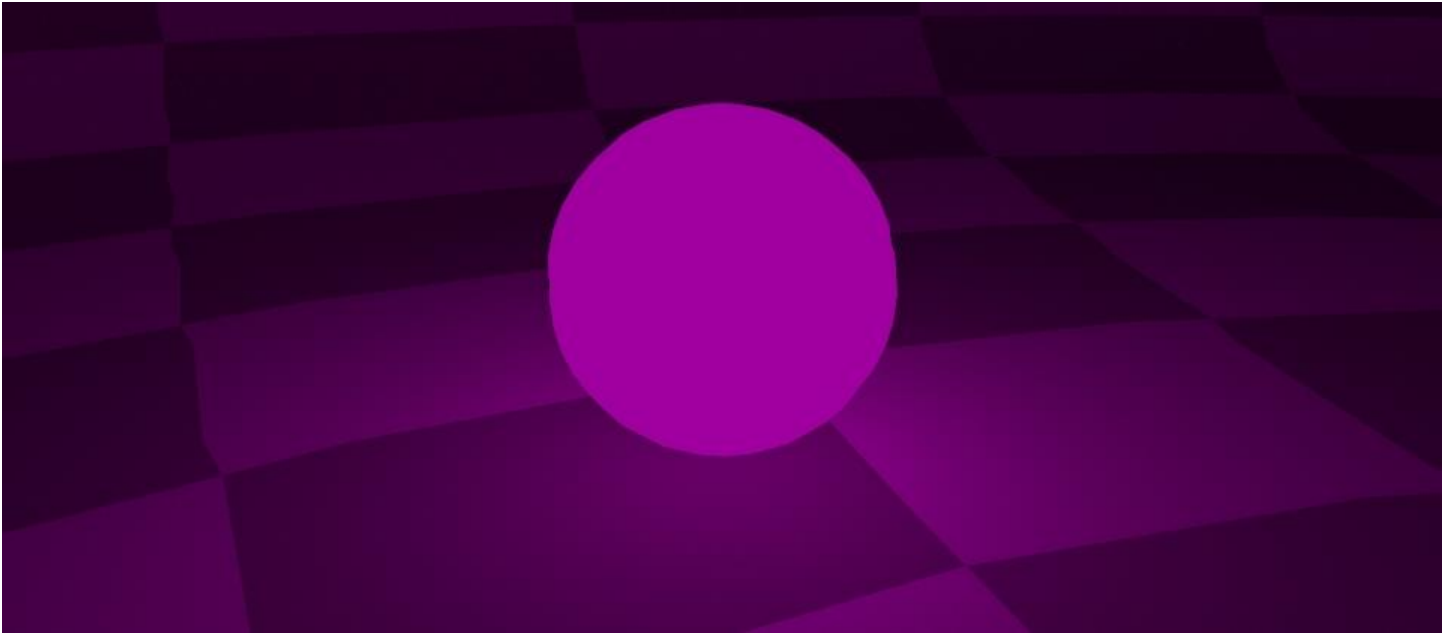
Material type set to **Refract**, this will give you the raw refraction of the scene and will also most likely be used in a **Blend material**:



Material type set to **Microfacet Refraction**, this material will simulate an opaque material like the paper on a Chinese lantern. It allows light to pass through it. You can change the amount of light that passes through the material by lowering the IOR(index of refraction) intensity.

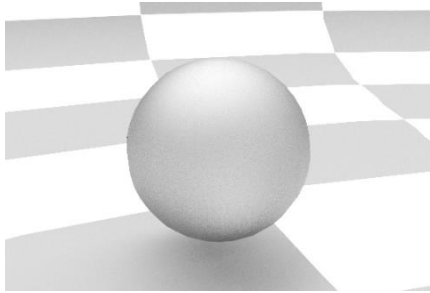


Material type set to **Emissive**, this material will emit light from geometry which has the emissive material applied to it:

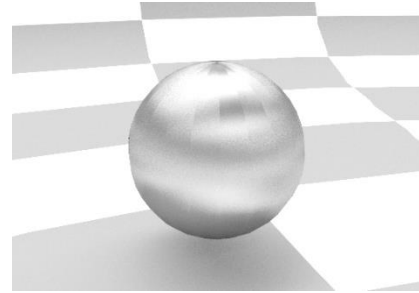


Material type set to **Ward**, this material will give you more of a metal texture, it has an anisotropic quality by means of roughness X and Y. Setting the X and Y values differently will give you different reflections (stretched).

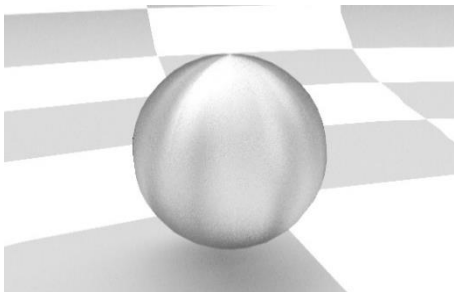
Default



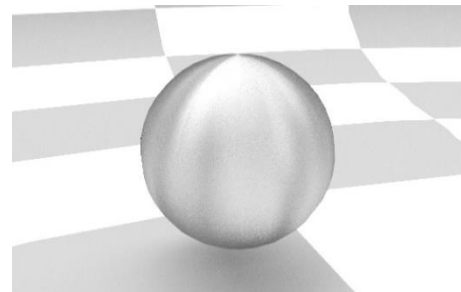
Roughness Y set to 0.1, X set to 0.5



Roughness X set to 0.1 Y set to 0.5



Rotation set to 45



Using Maya Materials

Like the Standard Lights many of the Standard Materials are not supported by AMD Radeon ProRender. Many of these materials simulate a physical effect on the surface of an object which is not required when using a physically based material and ray-tracing renderer.

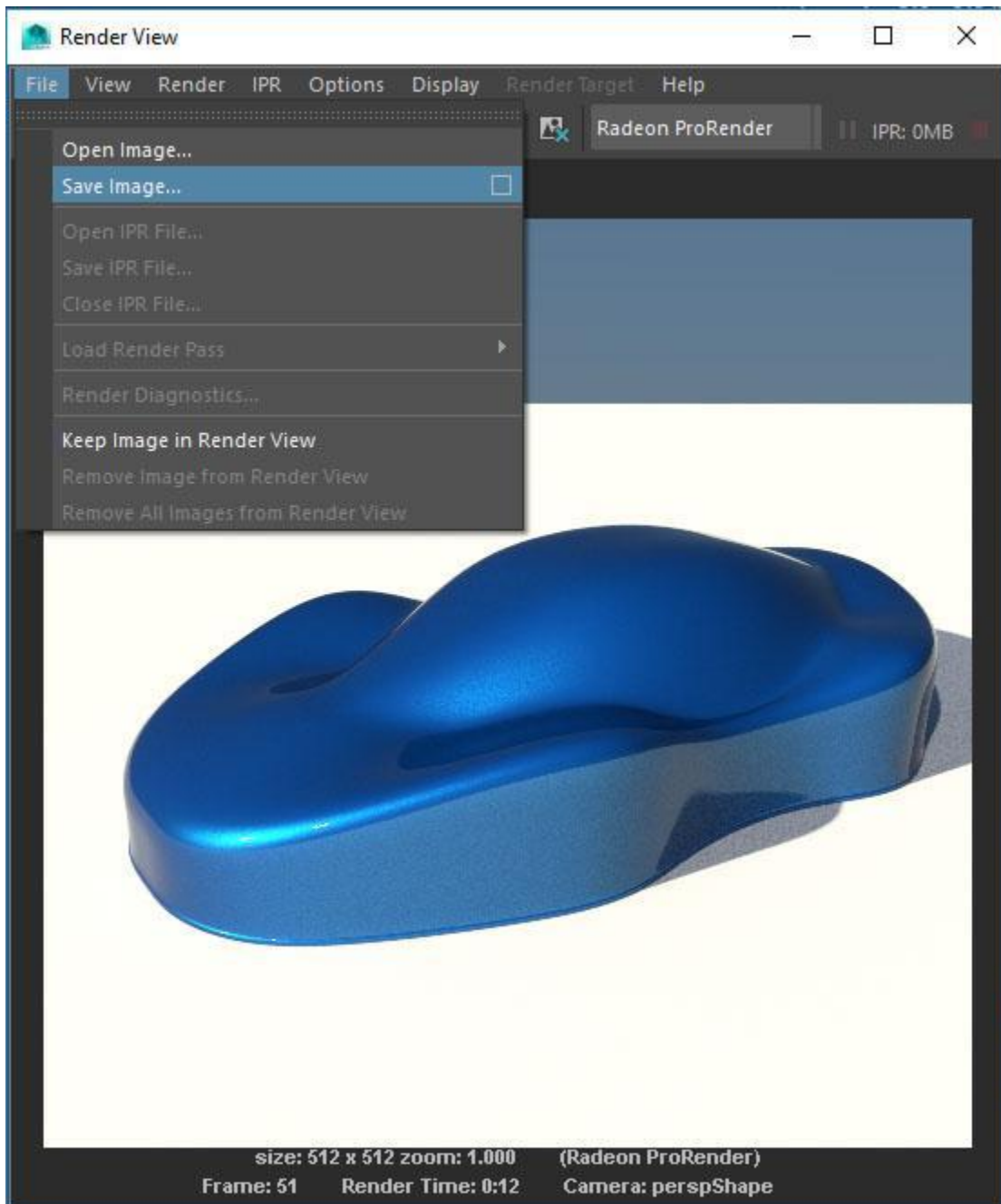
Although AMD Radeon ProRender will attempt to render the Maya Standard Materials, the result may be unpredictable as the renderer will only process the materials attributes that have a counterpart in the real world.

The specific models supported by AMD Radeon ProRender include:

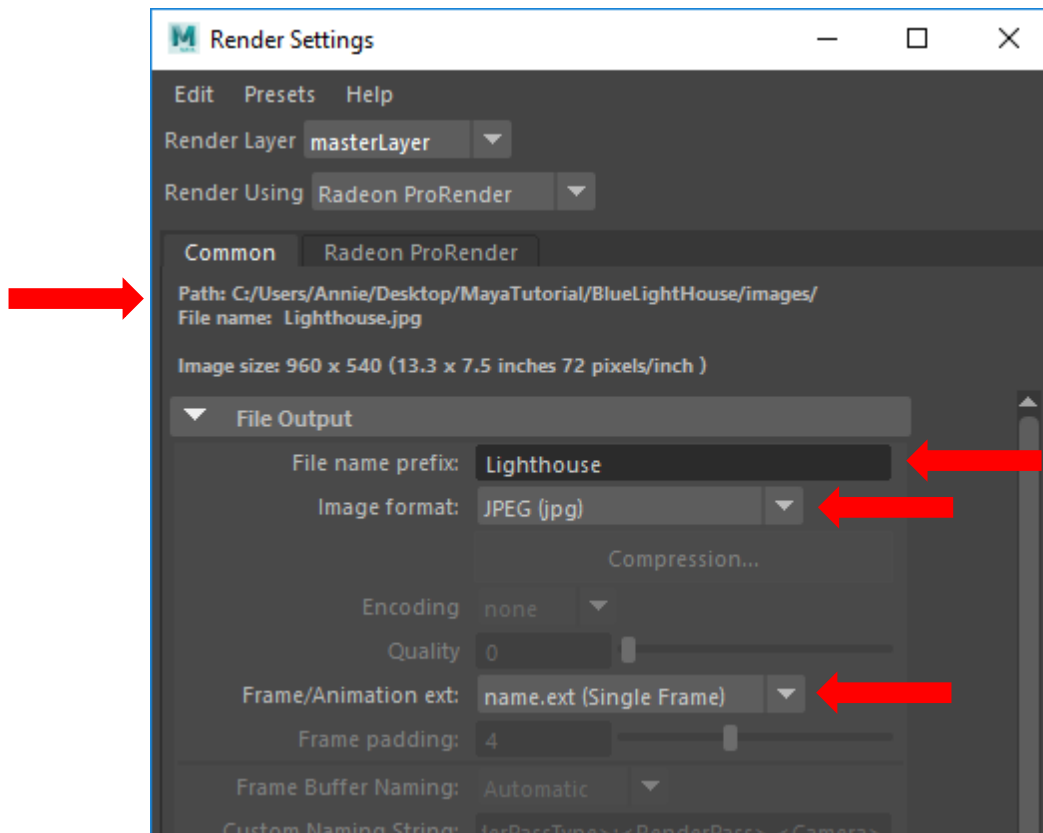
- Blinn
- Metallic
- MultiLayer
- Oren-Nayar-Blinn
- Phong
- Strauss
- Translucent

Saving

To save your rendered images you have 2 options. You can save the image directly from your render view window under **File > Save Image**. Remember to consider that in the save image options you must set what color management you would like to save your image in.



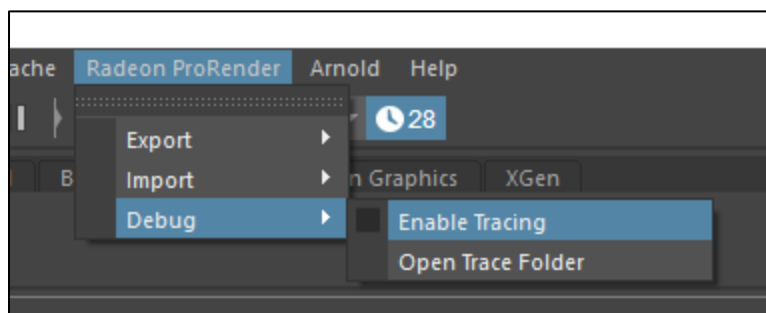
Then we can also save the rendered image by using the **File Output** section in the **Render Settings** (this is dependent on having your project set correctly). This is what you would use to render out batch animations and store the files in your project directory.



Diagnostics and Trace Files

To allow developers to track down issues with the plug-in it is often necessary to provide trace files that log what happened to the plug-in and where the plug-in may have had problems.

On the top-level menu select **AMD Radeon ProRender > Debug > Enable Tracing** to activate the diagnostic tracing feature.

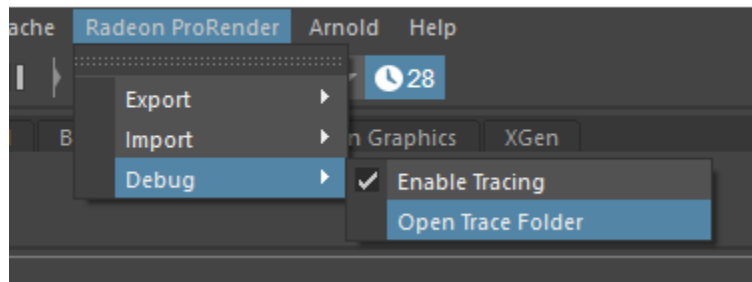


By default, the tracing is not set. This is to save space and assist performance. If you encounter a problem, it is advisable to:

- Enable tracing.
- Reproduce the problem.
- Locate the trace files.
- Zip the trace files into a single .zip file.
- Complete a bug report via this link <http://maya.radeonprorender.com/support/tickets>.
- If you don't have an account you will need to set one up.
- Describe the procedure or steps you used to reproduce the problem.
- Attach a sample scene of where the error occurred.
- Attach the trace files .zip to the bug report.

Once you have captured the trace file, repeat the selection above to disable the tracing feature. This will stop the plug-in from recording all events and using up your valuable disk space in the future.

You will see in the top-level menu and option to **Open Trace Folder**. Select **AMD Radeon ProRender > Debug > Open Trace Folder**.



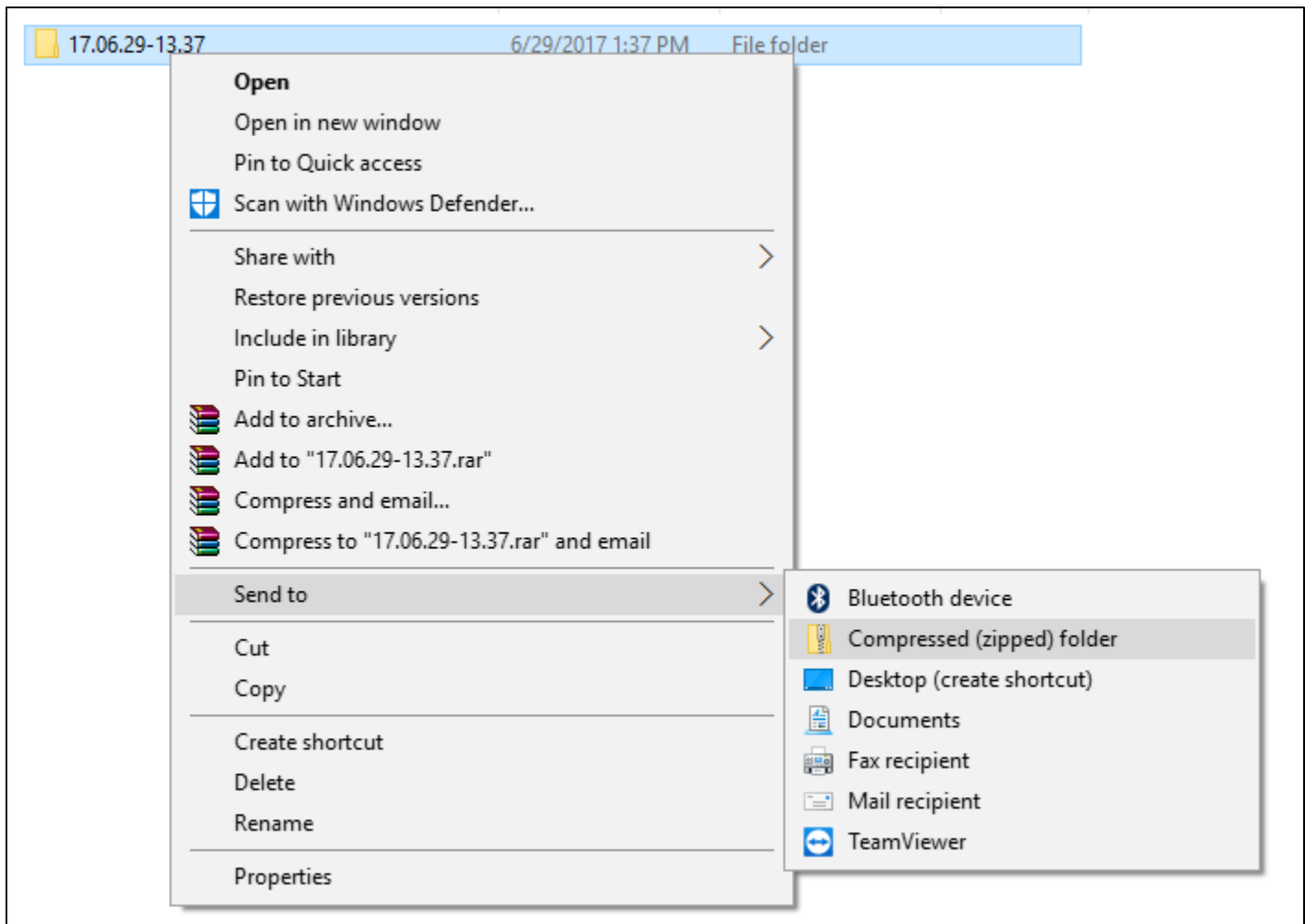
The directory location of the trace files is:

<%user%/AppData/Local/RadeonProRender/Maya/Trace/YY.MM.DD-HH.MM

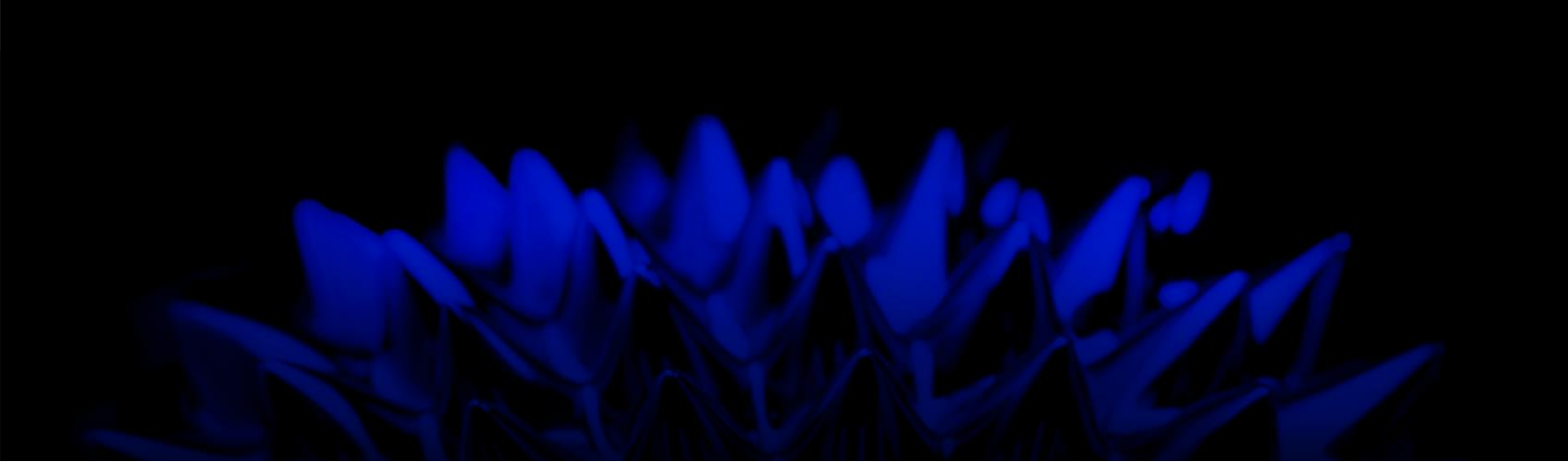
You will see there are a number of files generated by the plug-in's diagnostics system. Inside this directory are the following files:

Name	Date modified	Type	Size
rprTrace_data.bin	6/29/2017 1:37 PM	BIN File	0 KB
rprTrace_play1.cpp	6/29/2017 1:37 PM	CPP File	0 KB
rprTrace_player.cpp	6/29/2017 1:37 PM	CPP File	3 KB
rprTrace_player.h	6/29/2017 1:37 PM	H File	2 KB
rprTrace_playlist.h	6/29/2017 1:37 PM	H File	1 KB
rprTrace_variables.h	6/29/2017 1:37 PM	H File	1 KB

It is advisable to zip the top level directory **YY.MM.DD-HH.MM** by right clicking the directory and sending it to compressed zip file.



You can then attach this .zip file to any bug report you lodge.



AMD Radeon ProRender plug-in for Maya

User Guide

Written by: Annie Yu

08/13/2018

©2018 Advanced Micro Devices, Inc.

All rights reserved.