



indigo
renderer

Blender Exporter Manual



Image by EnricoCerica

Contents

Overview	4
About exporters	4
Acknowledgements	4
Installing Blendigo	5
Step 1. Ensure Blender is installed correctly	5
Step 2. Download and install Indigo	5
Step 3. Download and install Blendigo	5
Step 4. Split your viewport and open Blendigo	7
Things to know	8
Indigo is physically based	8
Units of measurement	8
Light sources	8
Realistic Materials	9
Getting to know Blendigo	10
1. The toolbar	10
2. Start render buttons	11
3. Main section	11
Camera settings	12
Render Dimensions	12
Film Settings	12
Aperture diffraction	14
Camera Settings	14
Environment settings	16
None(lit by mesh emitters)	16
Environment map	16
Physical sky+sun	17
Background Colour	18
Renderer settings	19
Render Type	19
Render Method	20
Advanced Settings	20
Tonemapping settings	21

<u>System settings</u>	22
<u>Performance</u>	22
<u>Halting</u>	23
<u>Image Saving Options</u>	23
<u>Networking</u>	23
<u>Other</u>	23
<u>Mesh settings</u>	25
<u>Material editor</u>	26
1. <u>Blender material</u>	26
2. <u>Indigo Material</u>	27
3. <u>Material Channels</u>	29
<u>Instances</u>	31
<u>Going Further</u>	32

Overview

This manual covers the installation and usage of the blender exporter for Indigo Renderer. By following the tutorials in this manual you should be able to export your scene in a high-quality way ready for Indigo to render.

Note that the Blendigo exporter is a very complex piece of software and not all the features are covered in depth by this manual. If a feature of Blendigo is not described to your satisfaction, visit our forum and post a question and we will be happy to help you out. Our forum is available at:

<http://www.indigorenderer.com/forum/>

About exporters

Indigo is independent of modelling package and uses it's own file format – called an Indigo Scene File (.igs). Before Indigo can render your scene, it must be converted into an igs file. The job of an exporter is to create an .igs file from your currently open scene.

Acknowledgements

The Blender exporter is called 'Blendigo' and is the result of the work of many people. Doug Hammond currently develops Blendigo and Glare Technologies would like to thank Doug for his work on the project, and the ongoing support he provides to Glare.

Glare Technologies would also like to thank the following people for their contribution to Blendigo:

Nick Chapman, U3dreal, Zuegs, Ewout Fernhout, Leope, psor, Wedge, SmartDen, BigFan and DaveC.

Installing Blendigo

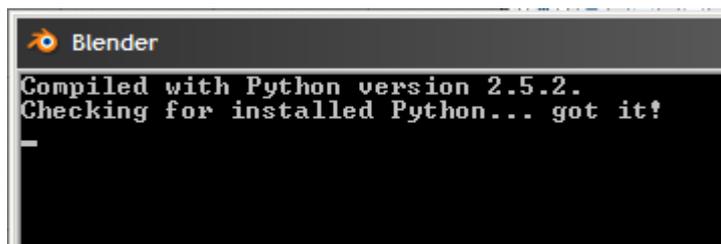
Step 1. Ensure Blender is installed correctly

Most of the problems people have with using Blendigo are due to Blender being incorrectly installed. We recommend you re-install the following packages to ensure that Blender is installed correctly.

Blender Get the latest release of Blender from:
<http://www.blender.org/download/get-blender/>

Python Get Python 2.5 from:
<http://python.org/download/releases/2.5.4/>

When you start Blender – the console window should give you a message saying it found the installed Python.



You are now ready to install Blendigo.

Step 2. Download and install Indigo

Download Indigo for your system and install it to the default location. Instructions for doing this are in the Indigo Manual
<http://www.indigorenderer.com/download/>

Step 3. Download and install Blendigo

Download the version of Blendigo for your system from:
<http://www.indigorenderer.com/documentation/blender>
Blendigo comes with an installer for Windows and Mac.

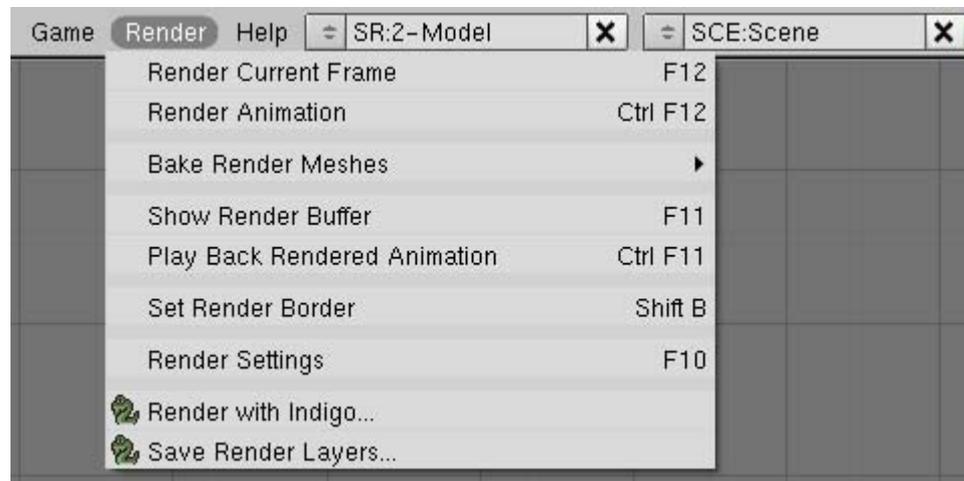
Windows: The installer will attempt to auto-detect your Blender installation, otherwise it will ask you for a Blender installation to put Blendigo into.

Mac: The installer automatically find Indigo in the **/applications** folder.

Linux: The installer will automatically install Blendigo for you.

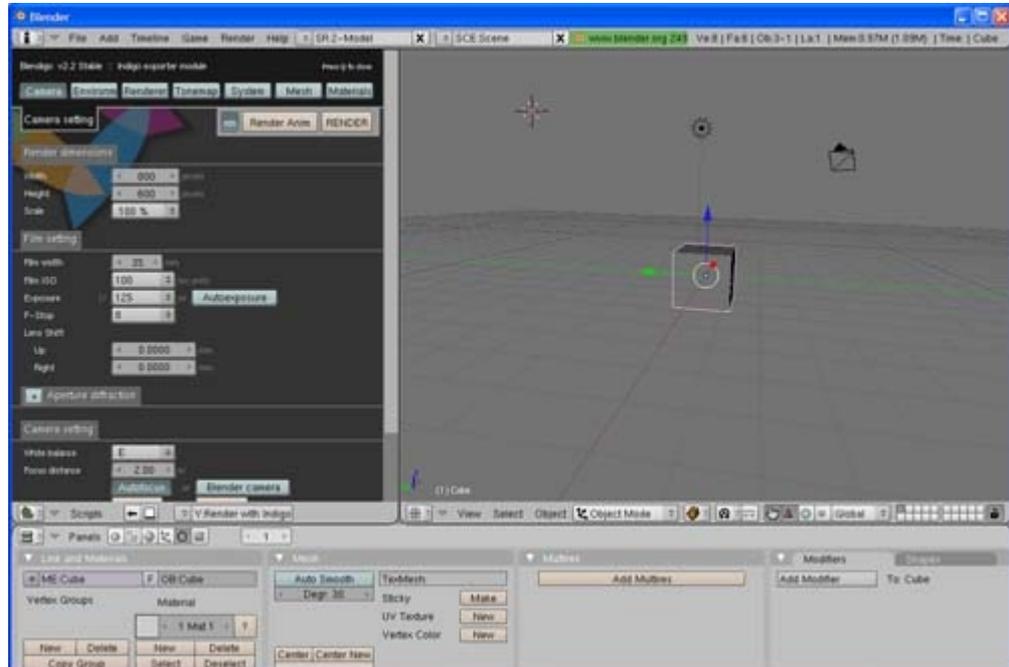
If the installer reports an error that it cannot find Blender on your system – please follow the instructions in Step 1 again and ensure you install to the default locations. If you have further issues – email us at support@indigorender.com.

Restart Blender after installing Blendigo and you should see see “Render with Indigo...” become available under the Render menu.



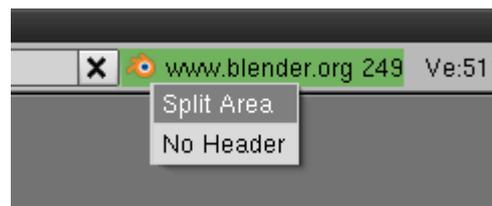
Step 4. Split your viewport and open Blendigo

To use Blendigo in the recommended way – you should split your viewport and have Blendigo open on the left hand side of your screen like so:



Blender with Blendigo open on the left and the 3d view open on the right.

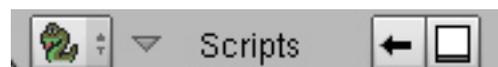
To split your view – right click on the bottom of the blendigo menu bar and press **split area**.



Right click on the black line under the titlebar

Click anywhere in the 3d window to confirm the split, then change the window type on one of the halves to **Scripts**, then select:

Scripts > Render > Render with Indigo.



The scripts window type

Blendigo will now open and stay open while you configure your scene. You are now ready to use Blendigo.

Things to know

There are several concepts you need to know to know to fully understand how Indigo works and how Blendigo treats these concepts. Refer to the **Indigo manual** and the **Techniques Manual** for more detailed information.

Indigo is physically based

Indigo is a physically based renderer, that means that if it is possible to construct a photo in the real world, it is possible to render it in Indigo. Blendigo has the job of converting the virtual world of Blender into the real world representation used by Indigo.

Users with experience of studio photography may find setting up a scene in Indigo a familiar experience.

Units of measurement

Indigo works on units of metres. Blendigo by default converts on Blender unit of distance to one metre in real world space. Select an object and press n to see the position of the object in blender units to get an idea of the scale of your scene. Because Indigo is a physically-based renderer, it is important that the scale is correct.

Light sources

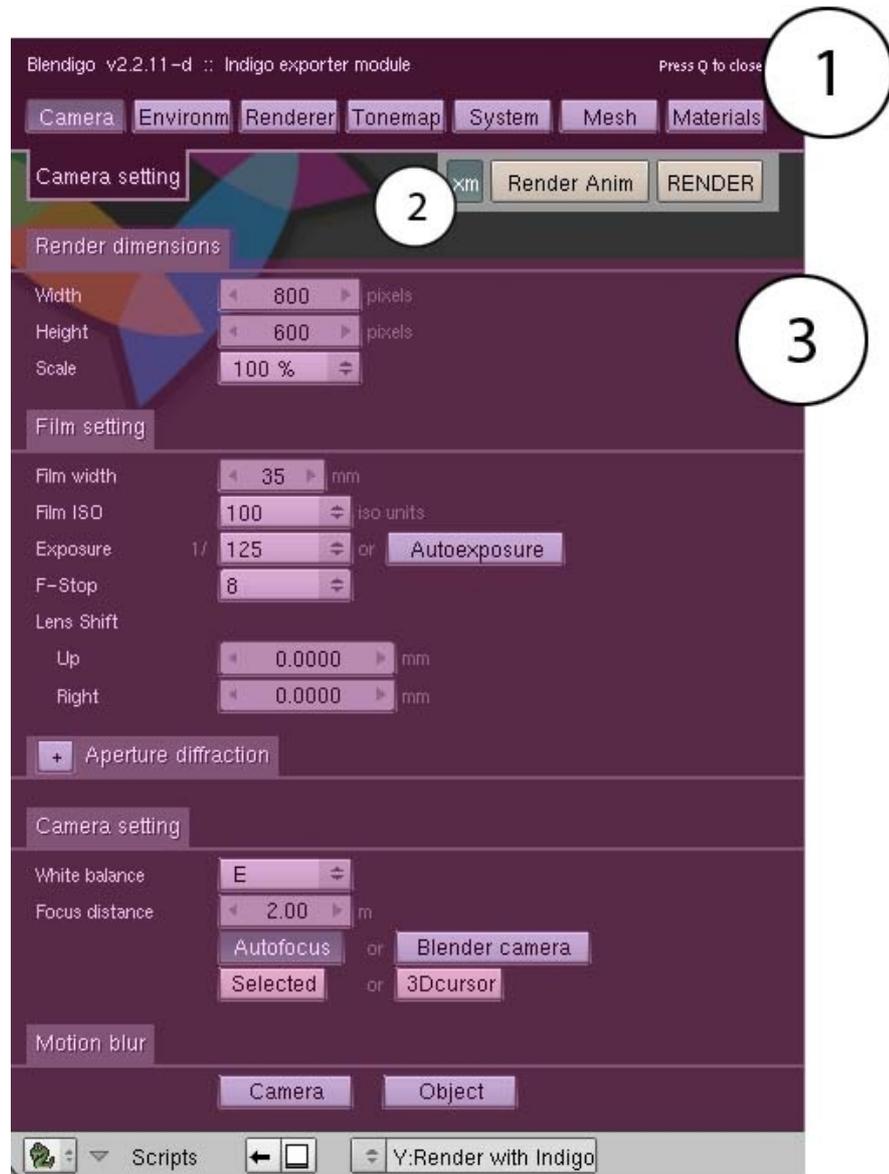
Blender has some light-sources that do not exist in the real-world – for example point lights (lights that are infinitesimally small and exceptionally bright) and 'invisible spotlights'. To use Indigo correctly you will need to master 'emitting materials' to create realistic lights in your scenes.

Realistic Materials

Because Indigo is a photo-realistic renderer, the material properties of objects must be of a higher detail to accurately simulate them. This not only means higher resolution textures, but also correctly set material types that describe things about the material, such as transparency, roughness of the surface, and how light moves through the object.

Getting to know Blendigo

This section will familiarise you with the Blendigo plug-in interface.



Blendigo interface

1. The toolbar

The toolbar lets you switch between different screens in the Blendigo. In the screenshot above, the camera screen is currently selected (notice the title below the toolbar)

2. Start render buttons

These buttons are visible on every Blendigo screen.

XM: Export Meshes. If you have already rendered the current scene and tweaked just materials and render settings but no meshes, then disable this button to speed-up export time. Default is enabled.

Render Anim: Creates Indigo scene files for each frame and renders them in order. Set Halt times to set how long Indigo renders each frame for.

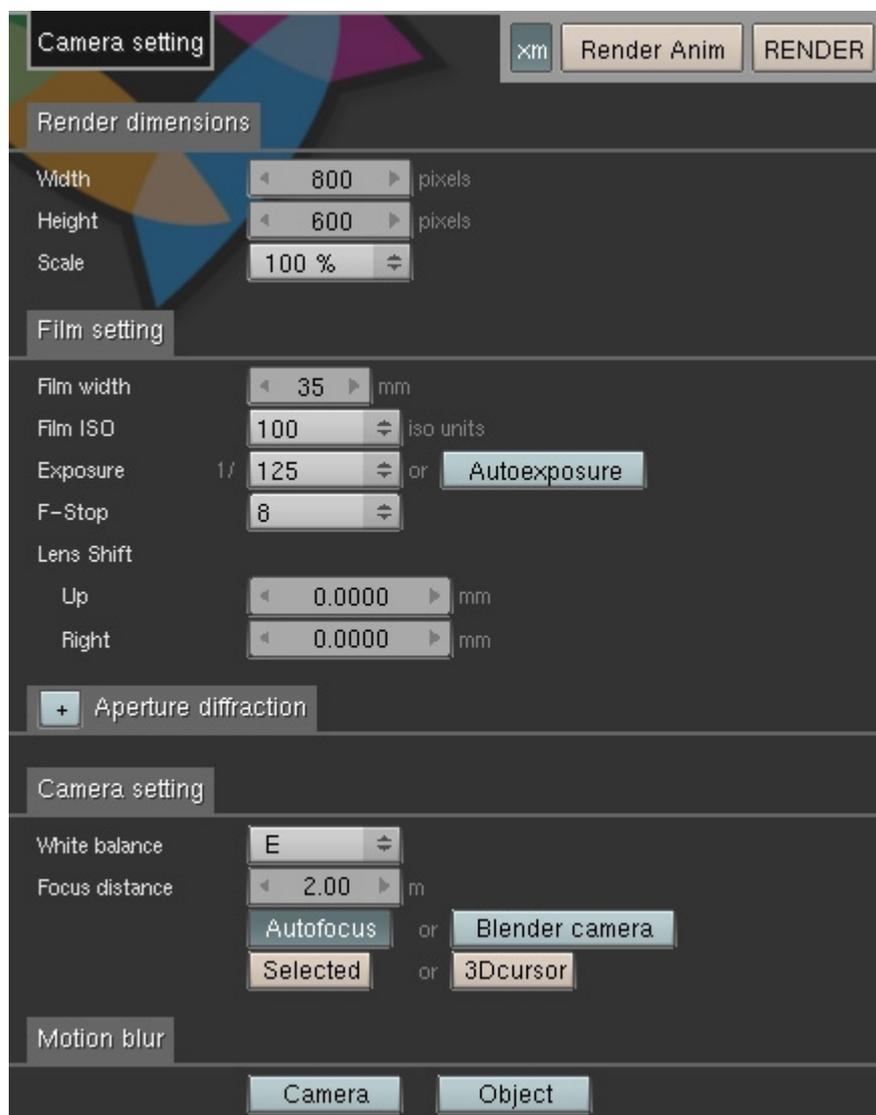
RENDER: Compiles an Indigo scene from your Blender scene and renders it with Indigo.

3. Main section

Here is where all the controls are for each Blendigo tab. Use this area to access all of Indigo's features.

Camera settings

The camera settings page controls the configuration of the virtual camera in the scene. The camera in Indigo is modelled on a real camera so the settings on this page will be familiar to users with a background in photography.



Render Dimensions

Sets the width and height of the rendered image in pixels.

Film Settings

These are the settings that control how Indigo 'captures' the image

Film Width: Width of the sensor element of the camera. A reasonable default is 0.036. (36mm). Determines the angle of view (FOV), together with the Lens sensor distance.

Film ISO: The ISO number represents the speed of film that is used. The higher the ISO number, the more light will be collected in the HDR Image. In low light situations, a fast film should be used, such as ISO 1600, and in bright lighting situations, a slow film can be used, such as ISO 100.

Exposure: This setting is used primarily to control motion blur. The other effect of exposure time (image brightness) is controlled instead by the tonemapping process.

F-Stop: This controls the focal length of the camera. Small f-stop numbers will make things that are out of focus more blurry (similar to shooting a photo in macro mode). Higher f-stop numbers will make everything in the scene equally in focus (this is similar to the effect of shooting a photo with a telephoto lens).



Depth of field

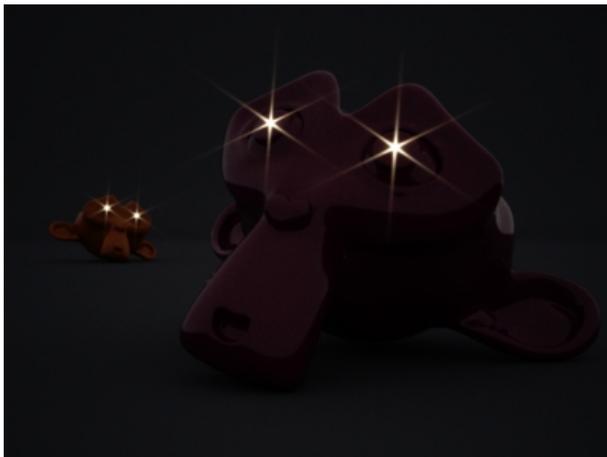
Lens Shift: Shifts the lens to compensate for perspective.

Aperture diffraction



Enabling aperture diffraction causes Indigo to render the 'star' effect around bright objects in the scene. This star effect is commonly seen in photos of spotlights.

To make aperture diffraction visible – you need to set a high f-stop (which causes a smaller camera aperture), have a small and extremely bright lightsource visible and then enable aperture diffraction.



Aperture diffraction on



Aperture diffraction on

Camera Settings

White Balance: Adjust the White Point to get rid of colored tinges to an image. Can be changed during or after rendering in the Indigo Renderer.

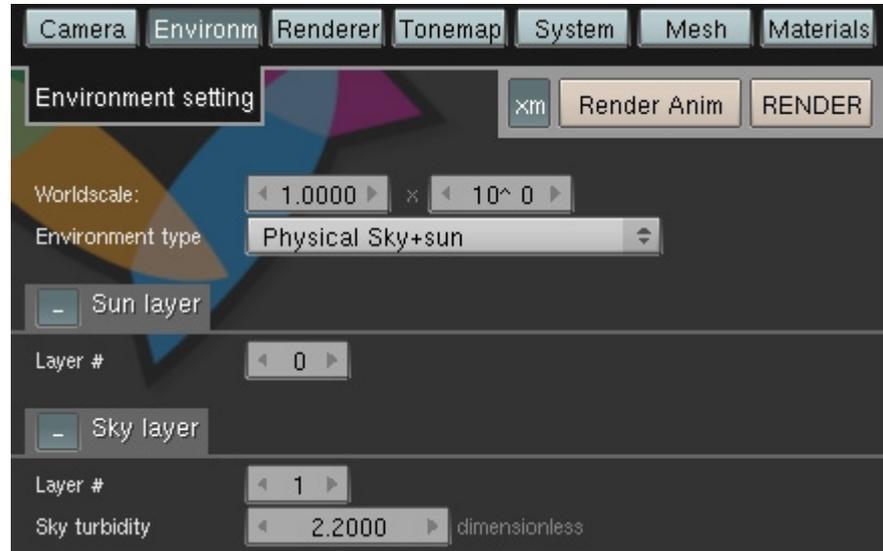
Focus Distance: The distance set at which objects become fully in focus. Autofocus sets the focal distance to the distance from the camera to the first object it sees in the middle of the frame.

Motion Blur: Enable motion blur. Blurs objects based on their speed between frames set.

Obstacle map:The obstacle map is for loading an image that will be mapped over the camera lens – this can be used to simulate dust, finger smudges and scratches on the lens.

Environment settings

The Environment screen controls the world lighting and background colour of the scene. The different environment settings are accessible from the environment-type dropdown.



Blendigo Environment settings

The worldscale values control how many metres 1 Blender Unit is equal to. The default is 1 blender unit = 1 metre.

None(lit by mesh emitters)

If this is selected then there will be no 'ambient light' in the scene and you must place your own lightsources in the scene. The background will be black when no environment is used.

Suzanne rendered with a mesh emitter and no environment.

Environment map

Suzannes rendered with the uffizi-large.exr environment map.

This setting requires you have an .exr file to use as an environment. Indigo uses the exr file as the background image and also as a light source.



Suzanne with an Environment map

Physical sky+sun

With this setting, Indigo will render a blue sky as the background of the scene and use a realistic sun to light the scene. The sky is modelled on a northern hemisphere sky. You must have a sun lamp present in your scene. Use menu->add->lamp->sun to add a sun lamp. The angle of the sun in the sky will be copied from the angle of the sun lamp.



Suzanne with a physical sky+sun environment

Background Colour

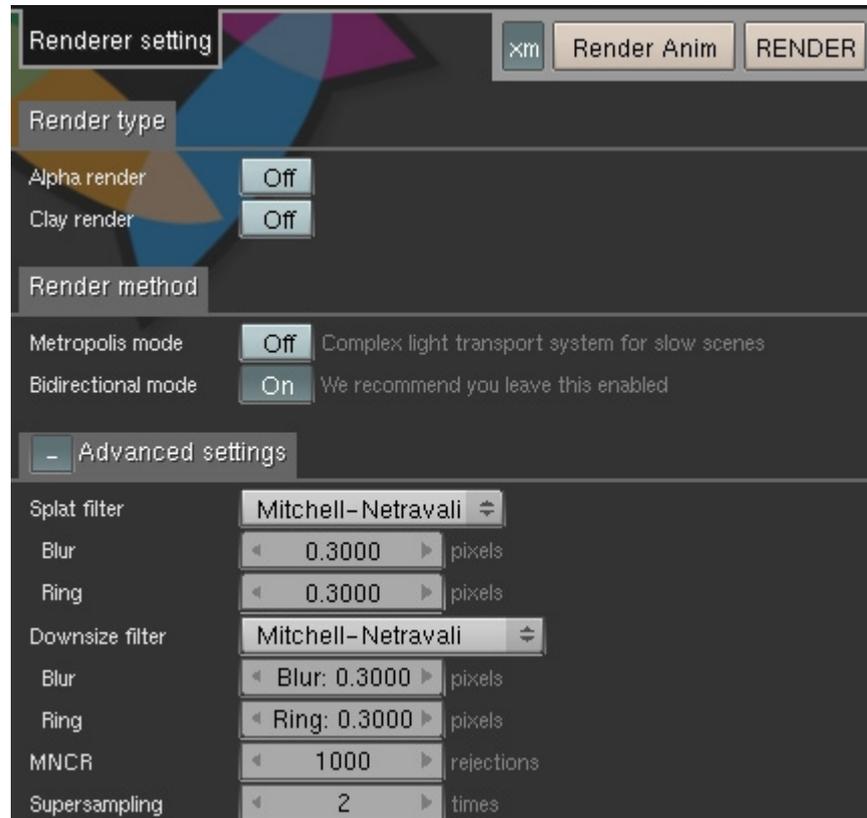
This environment setting is seldom useful. It is better to model a real studio setup (see the Indigo Techniques manual) – but as a quick alternative it is possible to change the background image of the scene using this setting.



Suzanne with a grey background environment.

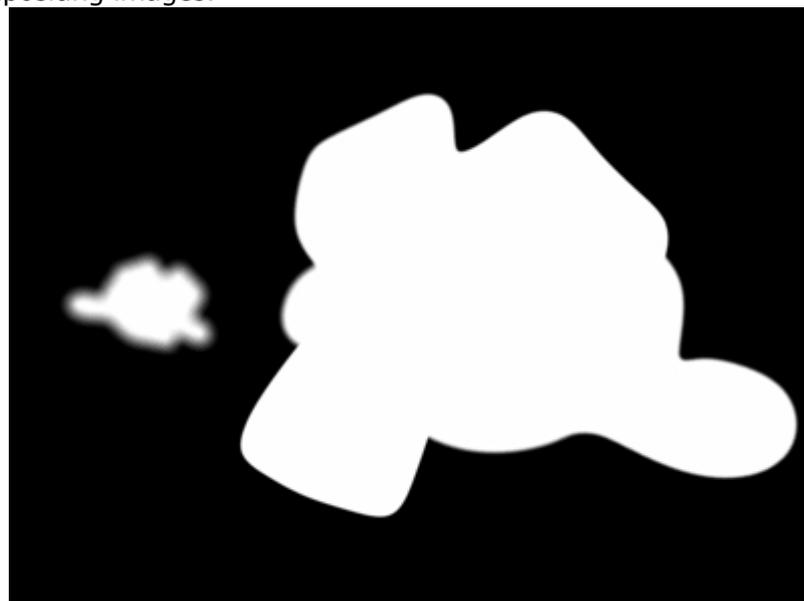
Renderer settings

Renderer settings are for controlling the inner workings of Indigo. Most Indigo users will not have to modify from the default Blender settings.



Render Type

Alpha render: Renders a black and white image to be used as an alpha map for compositing images.



Alpha Render

Clay render: If selected, exports the scene with all the materials replaced with a grey clay material. This can be used to get a quick 'draft-view' of the scene.



Clay render on



Clay render off

Render Method

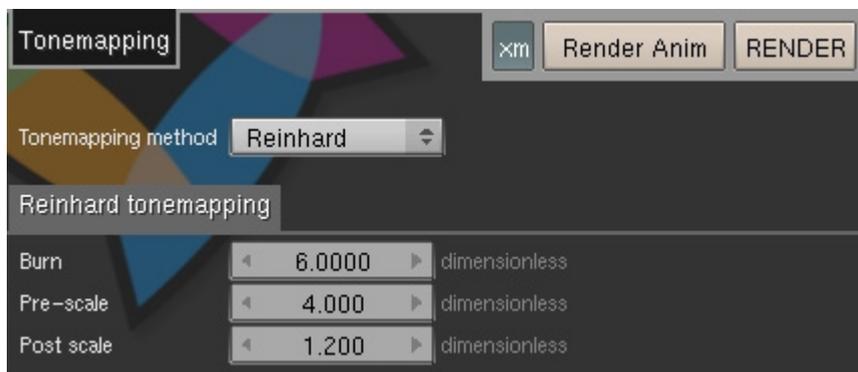
For most scenes, Metropolis should be off and bidirectional mode should be on.

Advanced Settings

These should not usually be changed.

Tonemapping settings

For most users – we recommend you leave these settings to the default and modify your tonemapping settings interactively in the Indigo GUI.



Tonemapping is a post-process that can be changed after, or during rendering in the Indigo GUI. Change settings here to save having to change them later.

Reinhard: Like the auto-exposure on a digital camera

Pre-Scale: Scale the mid-gray point of the rendered pixels.

Post-Scale: Scale the white point of the rendered pixels.

Burn: Burn determines the luminance that clipping occurs. A smaller value means more severe burn.

Camera: These settings are just like on a SLR camera.

ISO: Select the film speed. Higher means brighter, lower means darker.

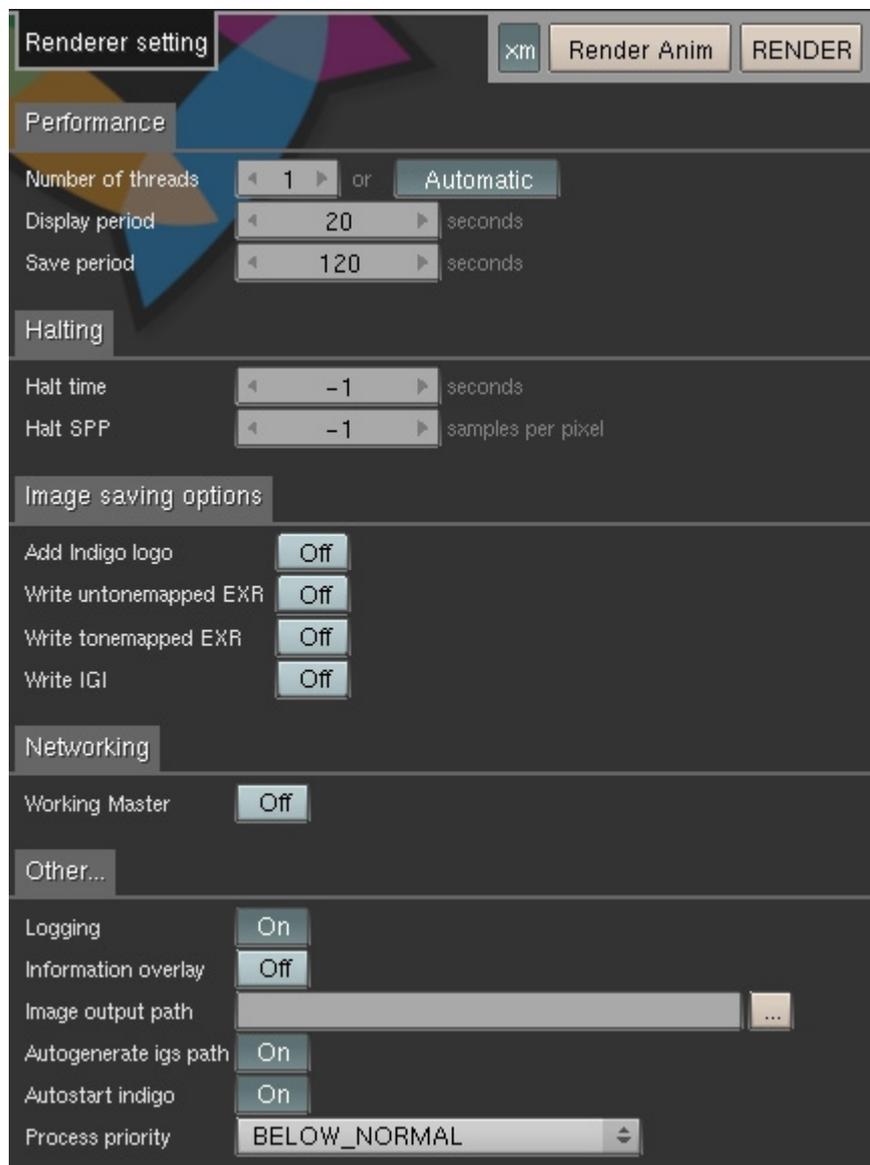
Shutter Speed: Select the reciprocal of the exposure time in seconds. Lower means longer, higher means faster.

Exposure: Select the exposure compensation (eV). Higher means brighter, lower means darker.

Response function: Emulates the type of effect given from camera selected.

System settings

System settings are for controlling the Indigo application. Most Indigo users will never have to modify from the default BlendoGo settings.



Performance

Number of Threads: Choose the number of CPU threads for Indigo to render with.

Save Period: Enter the time interval in seconds that the rendered image will be automatically saved.

Halting

Halt time: Indigo will stop rendering after the set amount of seconds and wait for the user to save the image.

Halt SSP: (samples per pixel) Indigo will stop rendering after the set amount of SSP and wait for the user to save the image.

Image Saving Options

Add Indigo Logo: Adds the Indigo as a watermark to the bottom-left of your render. Trail versions of Indigo will always render with the watermark.

Write untonemapped EXR: Saves an unadjusted HDR image from the render.

Write tonemapped EXR: Saves the tonemapped image as an HDR format.

Write IGI: Saves the render as an Indigo Image. Used to resume renders.

Networking

Working Master: This will set Indigo to render over the network with available slaves. **Working Master** renders the current scene along with coordinating the slaves. Network master only coordinates slaves.

Other

Logging: Keeps a render log. Useful for analyzing your Indigo as it renders.

Information Overlay: Puts render information (such as time taken to render and SSP) on the image itself.

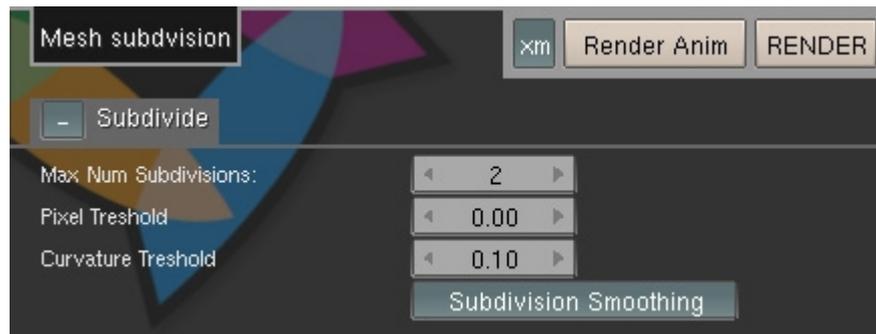
Image Output Path: Renders will be auto-saved to this directory.

Autogenerate igs Path: Use default.igs as the file name

Autostart Indigo: Open Indigo to render on export.

Process priority: At what priority for Indigo to render at. Below normal is the suggested level, as the system can become unresponsive at normal level.

Mesh settings



The mesh page enabled Indigo's internal subdivision tool per mesh.

To use it you need to have Indigo open, then select a mesh in your scene and enable subdivision. Indigo subdivision works the same as the subsurf modifier available in Blender.

It can be useful to use Indigo's built-in subdivision because the models in Blender can have a low polygon count that are faster to work with – yet you still get a high quality render.

Subdivision in Indigo can also be helpful for getting smooth results on objects that have *displacement mapping*.



Suzanne without subdivision



Suzanne with 5 levels of subdivision

Max Num Subdivisions: How many times to subdivide the mesh. Polycount becomes exponentially larger with each subdivision level.

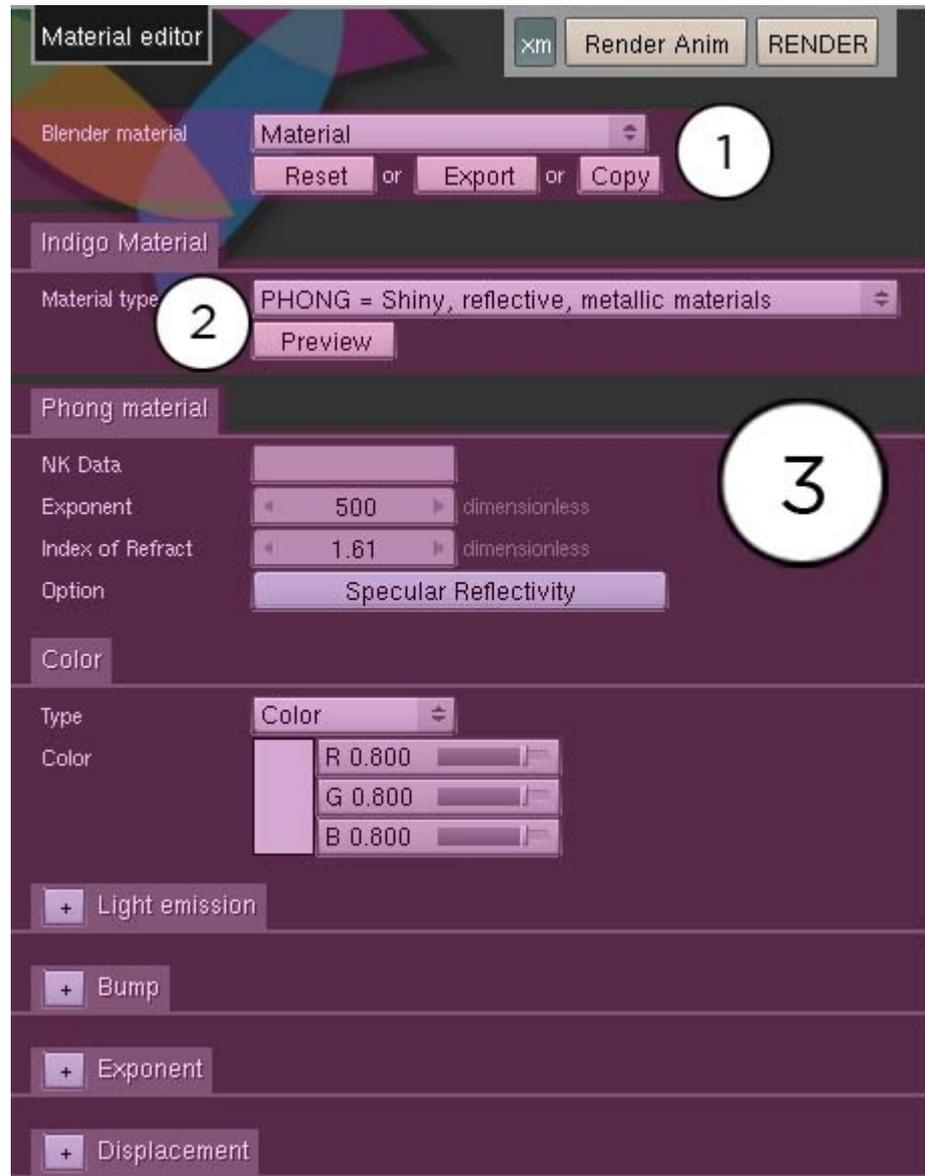
Pixel Threshold: Triangles will not be subdivided if they are smaller than this pixel threshold.

Curvature Threshold: Triangles will not be subdivided if their curvature is smaller than this threshold.

Subdivision Smoothing: Enables subdivision.

Material editor

The materials setting page is used to configure the materials in the scene.



Blendigo will try and convert your Blender materials to Indigo materials as far as possible – but you are recommend to use Blendigo's material editor for more accuracy and control of your Indigo materials.

1. Blender material

This is the name of the blender material you are editing. When you select a new object, the objects material will be selected in Blendigo – so just right click on an object in your scene to select it in Blendigo.

Reset: Reset to the original Blender material

Export: Export to an Indigo Material file (.IGM).

Copy: Copies the currently set Indigo material so you can copy it to another Blender material.

2. Indigo Material

Specifies the type of Indigo material to create. See the techniques manual for a list of the different material types. Selecting different material types will change the list of options below, some material types share the same channels as others.



DIFFUSE: Diffuse materials are flat, matte surfaces that don't have shiny edges. Flat wall paint, or a piece of paper are good examples of a diffuse material. There will be no particular reflection from a diffuse material.



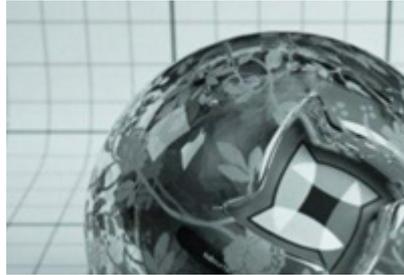
OREN-NAYAR: Oren-Nayar materials are very rough materials that scatter light in every direction. They are rougher than diffuse materials. Oren-Nayar is useful for creating surfaces that are like clay, or generally rough. They aren't shiny at all.



PHONG: Phong is a shiny material. Commonly used for shiny paints or any metals. In particular, phong will have a "specular highlight" where the light is completely reflected. Phong is useful for anything that has a lacquer applied to it - for example a shiny wood floor or a car paint.



SPECULAR: Specular materials are quite powerful and can be made to act as perfect reflectors (like a mirror) or as a fully transparent glass and anything in between. They have a medium which controls how light moves through the interior space of the object.



BLENDED: This is a material type that lets you create compound materials that are a combination of other materials. Blended materials have a 'blend map' that specifies how to blend the two sub-materials together. For example, you might have a shiny phong material combined with a rusty diffuse material. The blend map would show where the rust spots show through.

External: Link to an external .IGM or .PIGM file.

Exit Portal: Used to optimize indoor scenes.

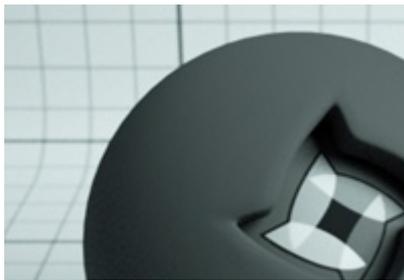
3. Material Channels

This list will change based on the selected material type. Here is a list of all available material channels.

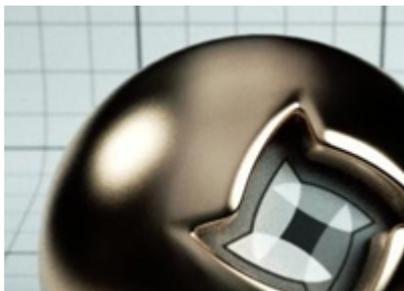
Transparent: Allows light to pass through the material.



Specular: Specular is as defined as above. Glossy Transparent is good for things like frosted glass and human skin.



Sigma: Defines the roughness of the surface.

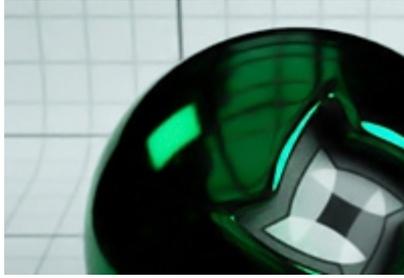


NK Data: Lab-measured metals.



Exponent: Controls the 'roughness' of the surface. The smoother the surface (or higher the IOR) the sharper the reflection.

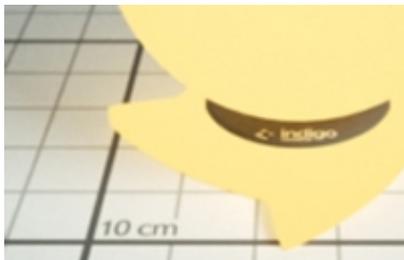
Index of Refract: (IOR) The amount of light reflected.



Specular Reflectivity: Changes the colour of the reflection rather than the surface colour.



Color: The color of the surface, including textures.



Light Emission: Emits light from the mesh surface. Used for all types of lights. Adjust parameters to change light color brightness.



Bump: Add a bump map. Does not displace the surface, just gives the illusion of a bumped surface.



Displacement: Add a displacement map. Displaces the surface of the object with the material applied.

Instances

Instancing is a way of duplicating objects many times without using extra RAM. Blendigo automatically creates Instances out of Blender duplicated objects (alt + D). They can only be transformed uniformly.

Going Further

You are now ready to start exploring Blender and Indigo. To learn more about using Indigo – see these resources.

The Indigo website:

<http://www.indigorenderer.com/>

The Indigo materials database:

<http://www.indigorenderer.com/materials/>

The Indigo forums are a lively place of debate - you should especially take a look at the Blender sub-forum.

<http://www.indigorenderer.com/forums/>

If you need support, please email:

support@indiorenderer.com

We hope you enjoy using Indigo and look forward to seeing your renders!