

Strata 3D 3.8 (*plus* and *pro*) are now running native on Mac OS X 10.x.

File Menu - Export...

Export is new to Strata 3Dpro 3.8.



Export... allows you to output your file to the various export options in Strata 3Dpro:



HOTKEYS AND MODIFIER KEYS FOR STRATA 3D 3.8 - Macintosh

Hotkeys for accelerating and decelerating movement of Camera controls, View Move, View Rotate and Nudging are now available in Strata 3D 3.8.

Nudging Modifier Keys

Command-(arrow keys) - Nudges the object at a faster rate and gradually gets faster as you hold down the keys. The acceleration factor for this command is 10. In other words, a Nudge setting of 10 -- ten nudges per unit -- would translate to 1 nudge per unit.

Option-(arrow keys) - Nudges the object at a slower rate and gradually gets slower as you hold down the keys. The speed deceleration factor for this command is 10 or 1/10 the default speed. In other words, a Nudge setting of 10 -- ten nudges per unit -- would translate to 100 nudges per unit.

Tool Palette - View Management Tools Hotkeys

Shift-1 = View Move
Shift-2 = View Rotate
Shift-3 = View Zoom

Note: The Caps Lock key is a toggle modifier for the View and Object Management tools. For example, with Caps Lock "ON" the above View Tools Hotkeys would change to 1, 2, and 3 respectively and the Object Management Tools: Move, Rotate, Scale Hotkeys would become Shift-1, 2, and 3, respectively. Also, please note that if you press 1 for the Object Move Tool and then press 1 again it will toggle to the previously used tool. This is similar to pressing the space bar to toggle between the most recently used Management tool and other tools in the tool palette.

Tool Palette - View Move Modifier Keys

Command = faster View Move adjustments
Option = slower View Move adjustments

Holding these keys while moving the view will cause the view to adjust faster or slower depending on the modifier key that you press.

Tool Palette - View Rotate Modifier Keys

Command = faster View Rotation
Option = slower View Rotation

Holding these keys while moving the view will cause view to adjust faster or slower depending on the modifier key that you press.

Camera Control Modifier Keys

Command-(Camera controls) - moves the object at a faster rate and gradually gets faster as you hold down the keys. The amount that the Camera will move is dependent on the Nudge sub-divisions value. The speed acceleration factor while using the Command key is 4. In other words, a Nudge setting of 10 -- ten nudges per unit -- would translate to 4 steps per unit.

Option-(arrow keys) - Nudges the object at a slower rate and gradually gets slower as you hold down the keys. The speed deceleration factor while using the Option key is 4 or 1/4 the default speed. In other words, a Nudge setting of 10 -- ten nudges per unit -- would translate to 40 steps per unit.

Rendering Window Zoom Modifier Keys

Renderings can be done at very large sizes that will flow off the screen. At times you may need to look at different parts of the rendering to determine that everything is set up correctly. In this case, you might want to Zoom In or Out of the rendering in progress. Strata 3D provides modifier keys that will let you use the Zoom Tool in the Rendering Window. These modifiers are as follows.

Command key - allows you to Zoom In on each click of the mouse button.

Option key - allows you to Zoom Out on each click of the mouse button.

Toon Display Hotkeys

a = Toon Flat

s = Toon Gradient

d = Toon Average

f = Toon BiLevel

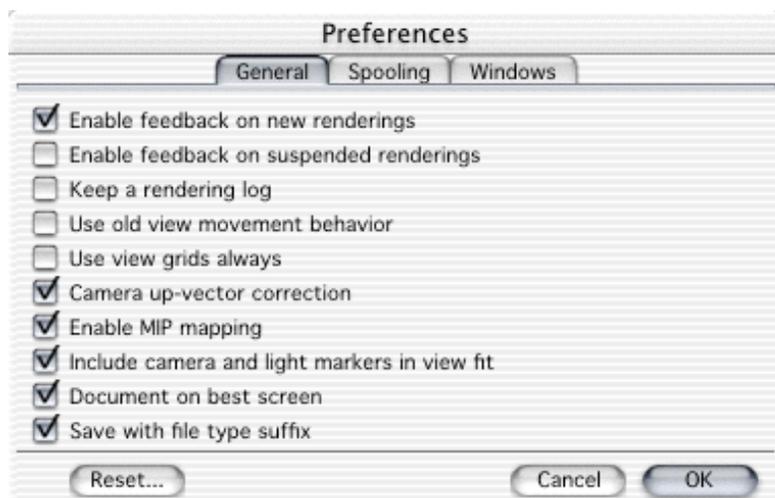
g = Toon TriLevel

Image Map Dialog Modifier Key

Option-click on the "Load..." button to access the color palette. Select a color and click OK to create a 4 x 4 pixel map for the property you clicked on to access the Image Map dialog. It is useful for creating single color maps in the caustic channel of surface textures. This can help achieve more realistic results in the refractive object's shadow when casting photons (see "*Raytracing -Caustics (Photon Mapping)*" below).

PREFERENCES - GENERAL TAB

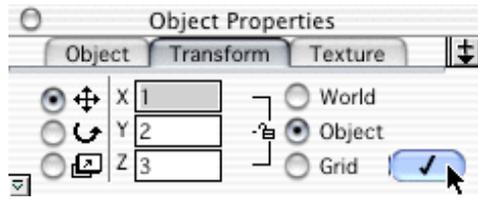
Two new options have been added to the Preferences General tab. The first is "Use old view movement behavior". This allow users who are familiar with Strata's previous view movement to continue using that behavior. The second addition is "Include camera and light markers in view fit". By default, camera and light markers are recognized by the "Fit Views to All" command (command=) found in the Windows Menu. To disregard these markers when fitting all items in a scene to the view, you will need to uncheck this option.



OBJECT PROPERTIES - TRANSFORM TAB

When using the Object Properties Transform tab for number positioning, rotating and scaling, there a few things to keep in mind. When working in the modes World, Size and Grid you may enter the value in the field and press the Tab key to commit the data and advance to the next field. However, the Object and Percentage

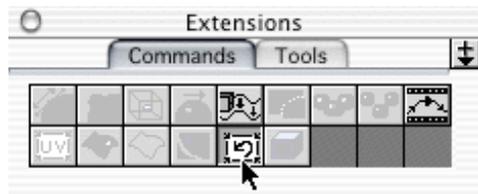
modes, are relative to the object itself. Therefore you must enter the data in each field and then press the Apply button (looks like a check mark) or the Enter/Return key to commit the data.



<-- To commit changes, click this button.

EXTENSIONS PALETTE - COMMANDS TAB - FLIP FACES

Flip Faces is a new command that will flip the faces of objects that may have surface direction information (known as "surface normals") turned in the wrong direction. Incorrect surface direction may present itself in renderings as incorrect shading or improper lighting based on the light position and the illumination on the object. In other words, the surface lighting may appear as if it were facing in the opposite direction than it actually is (ie: lit as if it were the bottom of the object, although it is actually facing up). In some cases, using the Flip Faces feature can help to correct this issue.

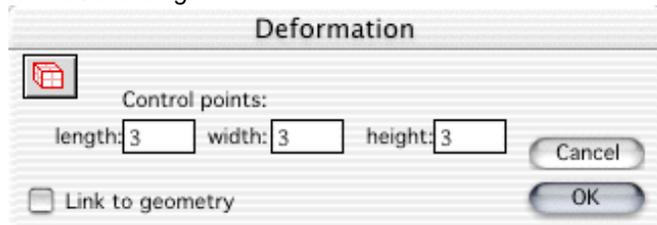


EXTENSIONS PALETTE - TOOLS TAB - DEFORM AND JIGGLE

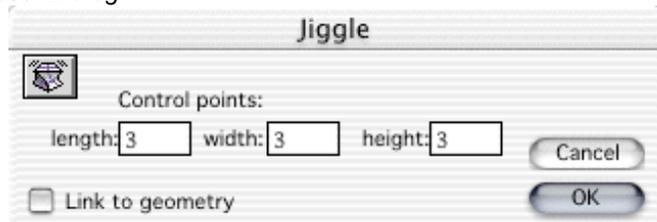
Enhanced Deform and Jiggle

Double-click the Deform and Jiggle tool buttons to get the feature addition. On both of these tools you may set up additional points to give you more controls with which to deform the object. See *Strata 3Dpro Reference Manual* pages 386 to 399 for more information on Deform and Jiggle.

Deformation Preset Dialog



Jiggle Preset Dialog



TOON RENDERER

Toon rendering is a new rendering and display option similar to OpenGL. The Toon renderer gives a cartoon-like rendering and allows you some control over the outline (silhouette) width and color. Quality can be set to "Fast" or "Accurate" and the Shading Profile can be manipulated by dragging the mouse over the field to make custom shades.

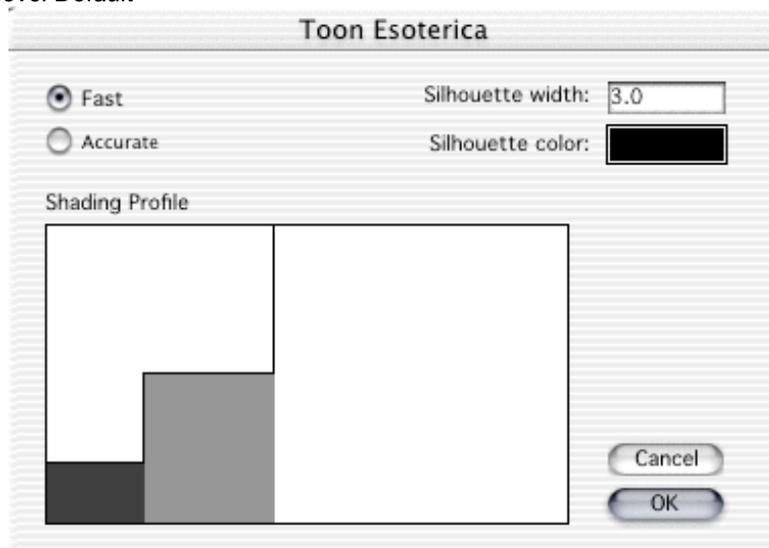
These modifier keys will help you to control your modification.

Command key - will give incremented steps for smooth gradients.

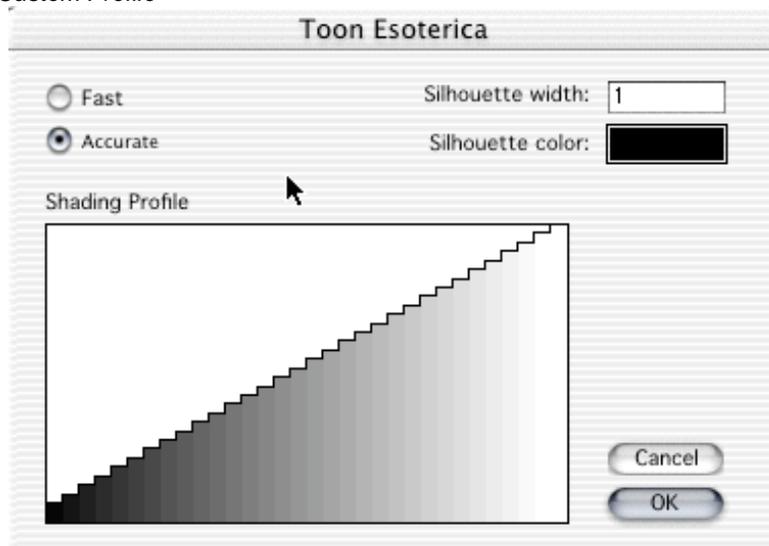
Shift key - will constrain to a level profile.

Expert Settings

Toon Tri-level Default



Toon - A Custom Profile



RAYTRACING - CAUSTICS (Photon Mapping):

Caustics are the effects of light as it passes through an object or as reflected off an objects. An example is the way light is affected as it passes through the water in a swimming pool, creating patterns of light and dark on the bottom of the pool.

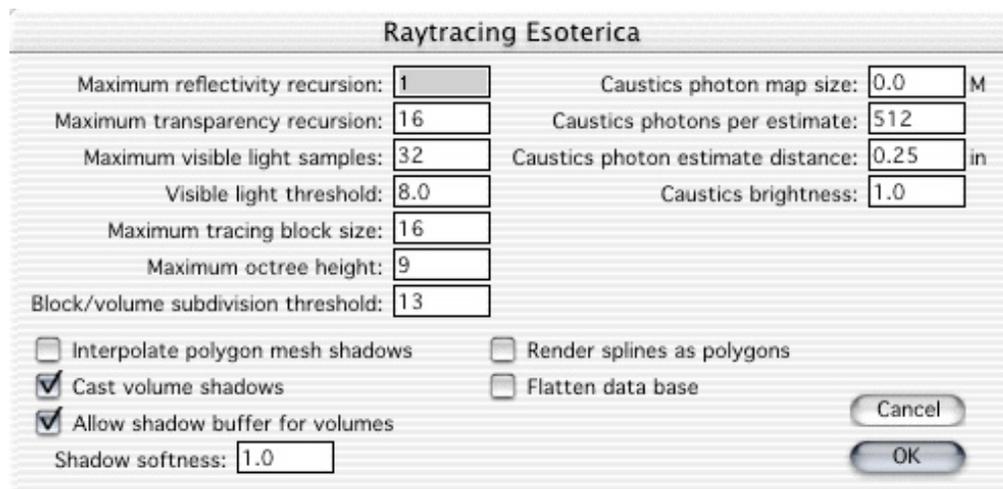
Caustics only work with Spotlights and Point lights. Global lights and Glow objects (see Note 1 below) will not generate caustics. Point lights and Spotlights have the ability to cast or not cast photons. This is determined by checking the Photon Cast option to cast photons or unchecking to not cast photons, in the Object Properties palette when the light object is select.

Caustics are data dependent. The distance of a light source from a refracted object, which will create Caustics, will have an effect on rendering times. The closer the light to the refracted object the longer the rendering time.

Caustics Settings

The Caustics settings are found in the Raytracing Esoterica settings dialog (Expert button with Raytracing selected as the renderer).

Expert Settings for Raytracing renderer



- **Caustics photon map size** - sets the maximum number of photons for _each_ light source, Point or SpotLight (in millions). Large numbers, in the millions, should be used to get effective results. However, there is a penalty for better Caustics: more time to render the scene. A setting of zero will cast no photons, meaning that no Caustics will be generated in the scene. Zero (0) is the default in the Raytracing renderer. You will need to select a Caustics preset: Draft, Normal, Fine, Very Fine; or enter a value in the "Caustics photon map size" field to enable photon casting. The map size dictates the limits of precision, with smaller values necessitating blurry and/or noisy caustics images.
- **Caustics photons per estimate** - This determines how many photons will be gathered to get a caustic light sample. A good value for this is dependent on the photon estimate distance. Higher values may give a better estimate.
- **Caustics photon estimate distance** - Determines how large an area will be searched, in model coordinates, for photons to include in a given pixel of the rendering, while the photons per estimate value puts a cap on how many will be gathered.

The distance measurement for the Caustics photon estimate distance is Strata units, that is 1/72th of an inch.

- **Caustics brightness** - A scaler on the collected light. Higher setting result in brighter Caustics.

The power of each photon depends upon four factors:

- 1) Whether photons are enabled for a given light.
- 2) The light color and intensity.
- 3) The "Total falloff distance" set for the light. <-- Work with this value on your lights, before using the Caustics brightness setting in the Raytracing Esoterica dialog.
- 4) The global Caustics brightness setting.

Spotlight and Point Light properties in relation to Caustics

The Spotlight and Point Light tools can be set to have Photons on or off in their Presets dialogs. Double-click the Spotlight or Point Light tool in the Tool Palette to access their presets. This will affect new lights. You can also change the light settings later in the Object Properties Palette or in the Project Window.

Total Falloff Distance:

The "Total falloff distance" is the distance at which the brightness of the light drops to an imperceptible level. The photon is given sufficient power to provide that minimal level of illumination with the assumption that light intensity drops off as the inverse square of the distance traveled. Setting a short distance will result in low power photons, while setting a very high distance will result in very high power photons. These photons should result in illumination levels similar to that of normal surface lighting given the same conditions. The default Falloff Distance in Strata 3D 3.8 for Point Lights and Spotlights should be sufficient when beginning to work with Caustics effects.

Total Intensity Distance:

The "Total intensity distance" is the distance at which the full brightness of light will be maintained before the light begins to falloff. In the real world light immediately begins to falloff. With this in mind, you might choose to set "Total intensity distance" to a very small value and increase the falloff distance to a very large value for a more realistic effect. The default Intensity Distance in Strata 3D 3.8 for Point Lights and Spotlights should be sufficient when beginning to work with Caustics effects.

Caustics brightness is not a real world setting, as intended. You should try to get the results you want without setting it to any value other than 1.0, because this is a multiplier on the photons energy distribution. However, you are (of course) free to do as you would like.

Notes:

1. Glow objects are a technique used with Raydiosity rendering to illuminate a scene. (This is achieved by applying a Surface Texture to an object where the "Glow" channel of the texture is set to some number above zero. In non-Raydiosity renderers, glow appears simply to brighten the surface of the object which has the glow applied and does not contribute to the illumination of the overall scene.)
2. Photon casting is the technology that allows Strata 3Dpro to create Caustics.

More On Caustics

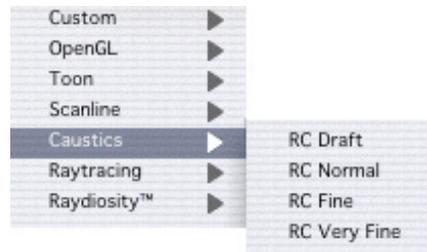
If Caustics are not showing then it may be that the estimate distance is too small to gather the photons. Set a higher value in the estimate distance to get a larger gathering area.

Too large of a setting in the caustics photon estimate distance can result in the caustics being smeared away to practically invisible, particularly with a large number of photons per estimate. Once the Caustics photon per estimate cap is reached, the circle within which photons are gathered will become smaller and smaller, throwing out more distant photons as closer photon samples are found. So setting the estimate distance and photons per estimate high will ensure a blurry photon effect.

As a rule, a "pinky sized" spot on the surface as seen in the camera window is pretty good. For a smaller photon map size you should use a smaller number of photons per estimate. If you really want to get a feel for things set the estimate distance very small, no larger than what would appear to be a several pixel wide spot in

the camera view, and the number of photons per estimate to a very low 1 to 8 or so. This will result in a very noisy rendering, but will let you see where individual photons are ending up. Then choose an estimate distance that gives you a circle with a radius large enough to take in a good sampling.

Caustic Rendering Presets in Tool Palette and Render dialog



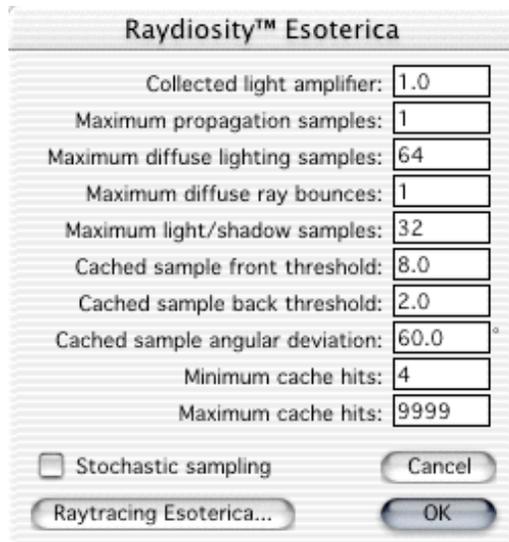
Quick Tutorial

1. Open a new document.
2. Create a large floor surface with the Oval or Rectangle tool.
3. Create a sphere on the floor surface.
4. Apply the Glass texture to the sphere. (Found in Resource palette, Texture tab, Basic)
5. Create an open ended cylinder (no end caps) about the size and height of a ring and apply the Mirror texture. (To make a cylinder with no end caps use the Object Properties palette, Object tab and uncheck "End Caps")
6. Position a point light a little above the sphere and the cylinder, and off to one side.
7. Position the sphere and cylinder within the point light's illumination area, if needed.
8. Select the Caustic > RC Normal setting in the pop-up menu at the bottom of the Tool palette and click in the modeling window.
9. Wait for the rendering to complete to see the Caustics effect in the shadow of the sphere and in the reflected area of the cylinder.

RAYDIOSITY

Two items have been added to the Raydiosity Esoterica dialog: Stochastic Sampling and Maximum Diffuse Ray Bounces.

Expert Settings



- **Stochastic Sampling checkbox:** This field turns random sampling on or off. With this field on, the pattern of light rays traced within each cone of rays is randomized. This typically produces an image with a more realistic appearance. Without random sampling, the pattern of rays in each cone of rays generated by a ray reflection are symmetrical and uniform; resulting in an image that is more obviously computer generated.
- **Multiple Diffuse Ray Bounces:** This field determines how often a secondary ray is traced during reflections between adjacent objects. If a secondary ray reflects or bounces off another object, it may also reflect off a third object, which, if close enough, can possibly contribute to the primary object's surface illumination.

A setting of one means the algorithm ignores the secondary light ray after the first bounce. The more bounces through which a ray is traced the more the adjacent surfaces contribute to the primary surface's appearance, and the longer the rendering time.