



# Hydra Renderer

Quick Start  
v1.9a

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# Installation

- You will need:
  - CUDA driver 5.5 or higher
    - You don't have to install CUDA Toolkit, just have last NVIDIA driver
  - Any CUDA enabled GPU
    - CUDA Compute Capability 1.0 is minimal (no IC, no SPPM)
    - CUDA Compute Capability 1.1 is ok
    - CUDA Compute Capability 2.0 is recommended
    - ~1Gb video memory is recommended
  - Please visit <http://nvidia.com/>

# Installation

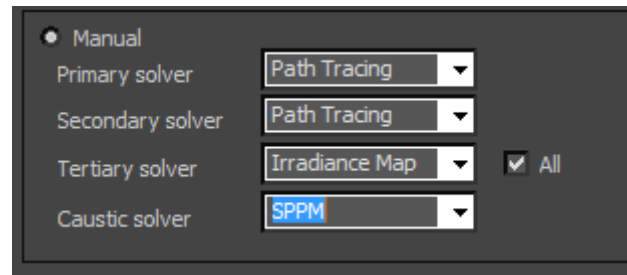
- For 3ds Max:
  - Copy hydraRender\_mk3.dlr and HydraMaterial.dlt to 'C:\Program Files\Autodesk\3ds Max 2013\plugins'
    - If you use 32 bit version or 2014 max, please copy these to the appropriate max 'plugins' directory
  - Copy appropriate (32 or 64 bit ver) directory '[Hydra]' to 'C:\' to form 'C:\[Hydra]'

# Scene export

- Autodesk Max 2013/2014
  - In the same way as any other renderer
  - **Don't use hydra for material editor! Use scanline.**
  - If you want to use max + external gui, please launch 'hydra\_gui.exe' first, then check 'Use External Hydra Gui' in max and press 'Render'
- You may also try use external gui (hydra\_gui.exe) and open scene with
  - FBX COLLADA
  - OpenCollada (usually works better)

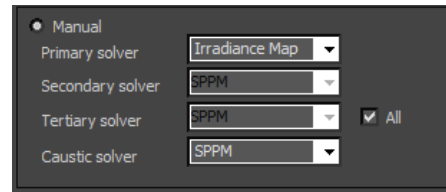
# Render modes in 3ds max

- Like V-Ray, but:
  - Irradiance Cache instead of V-Ray's 'Irradiance Map'
  - Irradiance Map instead of V-Ray's 'Light Cache'
  - Path Tracing instead of V-Ray's 'Brute Force'
- For Caustics use SPPM:

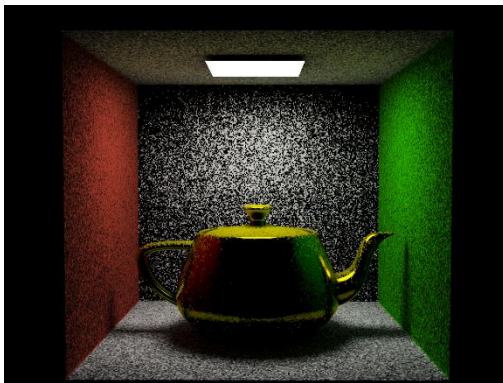


# Irradiance Map

- First, you recommended to see how it looks by doing this:

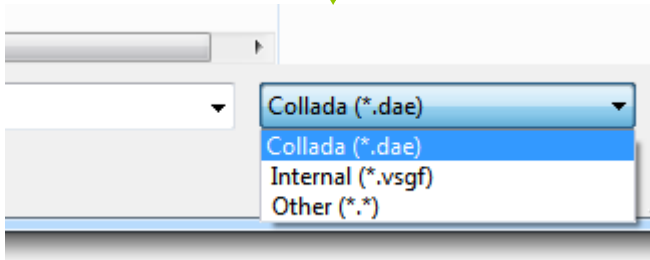


- If Irradiance Map has black squares, increase SPPM(diffuse) gather radius



# Open scene from file

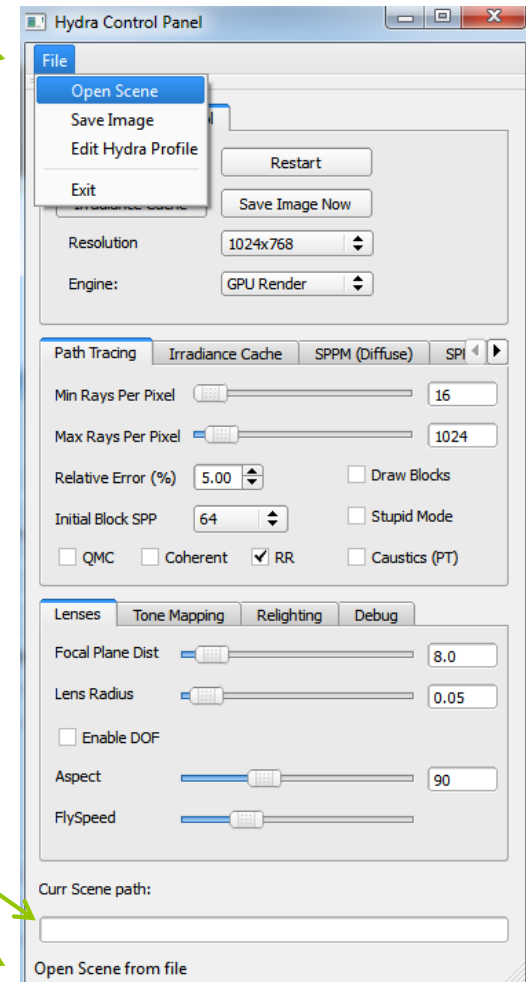
Don't forget to select right file type



Current path displayed here

Prompts displayed here

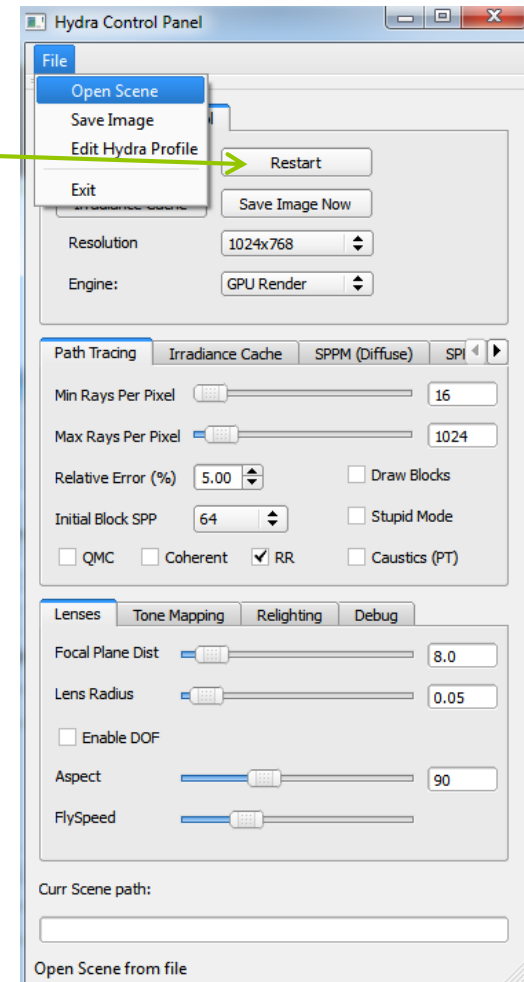
**Don't use unicode path!**



# Starting renderer

Press “Restart”

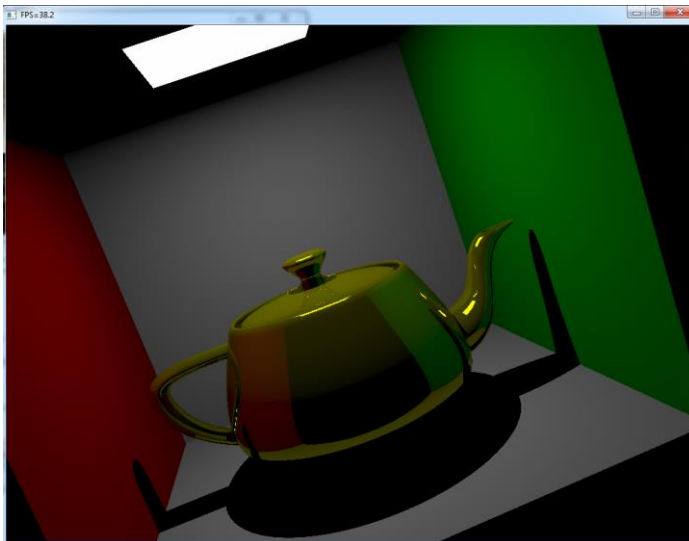
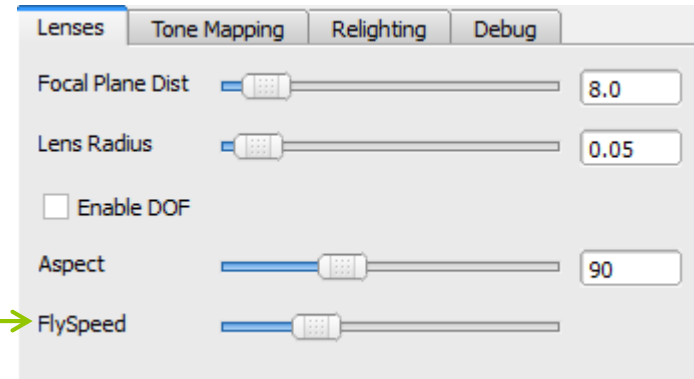
If nothing happened run hydra.exe  
from the command prompt  
after “File->Open Scene”





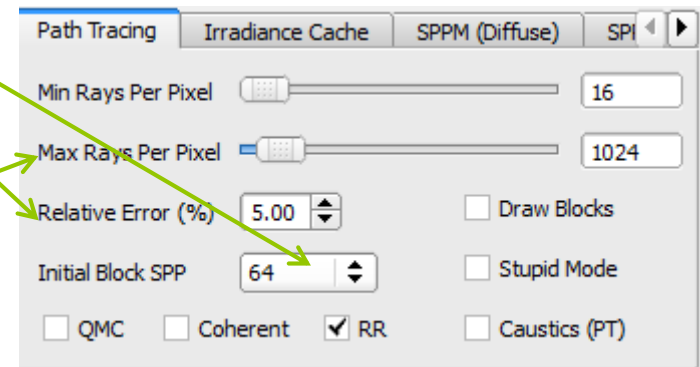
# Move over the scene

- W,A,S,D (like in 3D shooters)
- R,F (up and down)
- Q,E (rotate)
- 'Shift' to fly faster
- You may also change fly speed here →



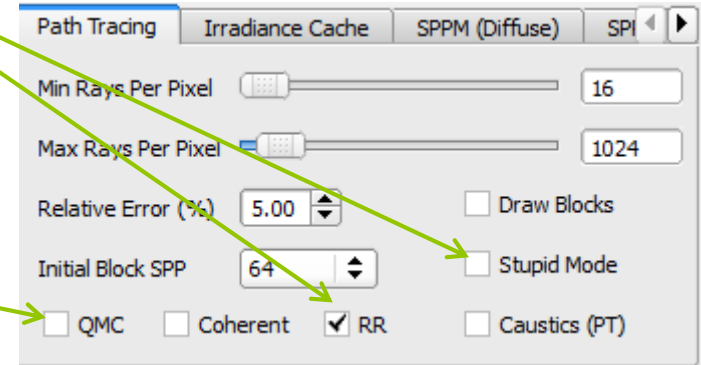
# Path Tracing

- Progressive Mode (default)
- Production Mode
  - Path Tracing -> Set “Initial Block SPP” to 64 or higher
- Quality control
  - Set relative Err for HDR image
  - But not more than max samples
- When change Path Tracing settings
  - You’ll see the effect when run Path Tracing again



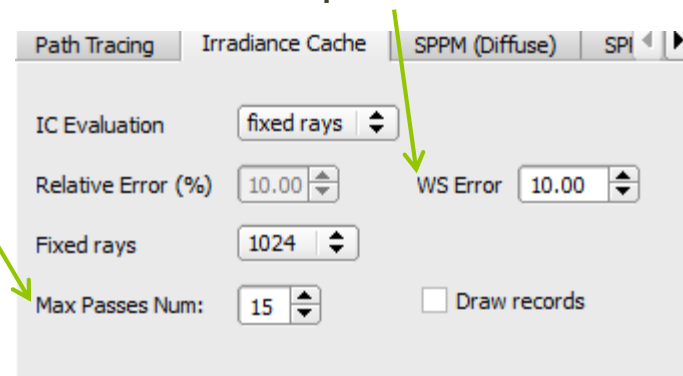
# Path Tracing (advanced)

- Stupid Mode
  - Stupid Mode will not use any shadow rays
- Per Warp Russian Roulette (RR)
  - Disable if see small rectangle blocks
  - Good for performance on scenes with strong indirect lighting
- Quasi Monte Carlo (QMC)
  - It is actually “Coherent QMC”
  - Run faster but gives banding
  - Use it if you need extra quality and very high maximum number of samples are selected



# Irradiance Caching

- Use it manually by pressing “Irradiance Cache”
- Then press “Path Tracing” to render final image
- Please reduce manually maximum rays per pixel for Path Tracing if it hangs too long when IC computed
- Reduce passes number or increase World Space Error if there too many records



# SPPM (Caustics)

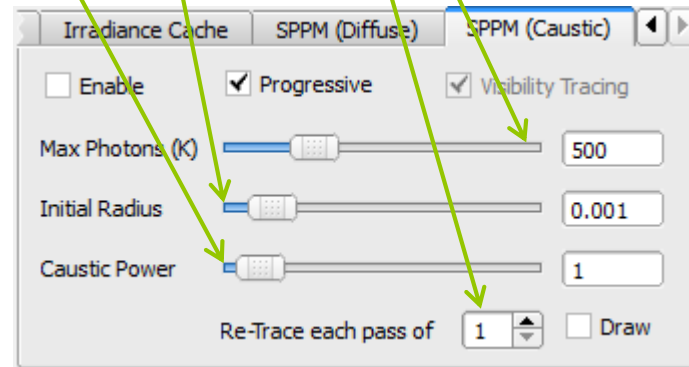
- Stochastic Progressive Photon Maps (SPPM)
  - Should be used with Progressive Path Tracing mode
  - Only single light is supported correctly for now
  - You may disable other lights with like this:

```
<general>  
  <type> spot </type>|  
  <disable_for_photonmap> 1 </disable_for_photonmap>  
</general>
```

- Run SPPM for caustics:
  - SPPM (caustics) -> Check “Enable” checkbox
  - Please increase manually minimum rays per pixel for Path Tracing up to 128 – 256
  - Press “Path Tracing”

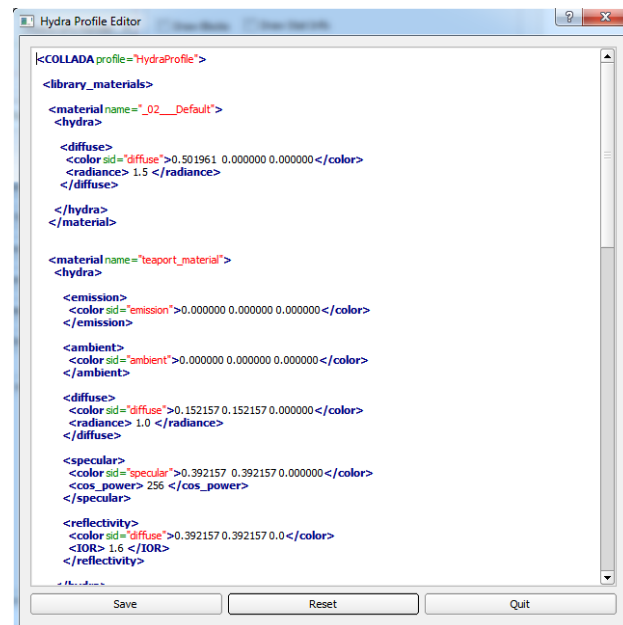
# SPPM (Caustics)

- Balance between amount of photons and gather rays
- Balance between noise and bias
- Controls caustic brightness



# Hydra materials and lights

- File->Edit Hydra Profile
- Documentation located here
  - <http://ray-tracing.ru/articles235.html> (rus)



# Hydra materials and lights

- The 'Hydra profile' mechanism was created to replace any 'standard' materials and lights with the internal Hydra materials and lights
- But you also can add new lights to the scene in the same way
- To replace material or light you need to specify appropriate **same** material/light name
- When adding light you may specify any light name

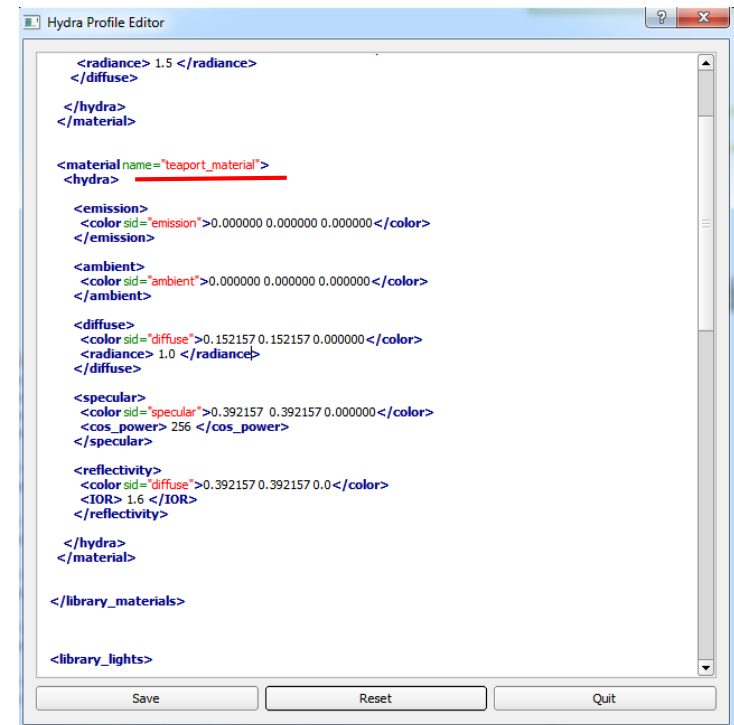


# Hydra materials and lights

- Example of replacing:  
Collada file:

```
<effect id="teaport_material-fx" name="teaport_material">
  <profile_COMMON>
    <technique sid="standard">
      <phong>
        <emission>
          <color sid="emission">0.000000 0.000000 0.000000 1.000000</color>
        </emission>
        <ambient>
          <color sid="ambient">0.000000 0.000000 0.000000 1.000000</color>
        </ambient>
        <diffuse>
          <color sid="diffuse">0.392157 0.392157 0.000000 1.000000</color>
        </diffuse>
        <specular>
          <color sid="specular">0.392157 0.392157 0.000000 1.000000</color>
        </specular>
        <shininess>
          <float sid="shininess">256.000338</float>
        </shininess>
        <transparency>
          <float sid="transparency">0.000000</float>
        </transparency>
      </phong>
    </technique>
  </profile_COMMON>
</effect>
```

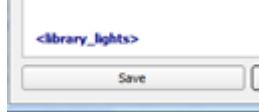
hydra profile:



# Hydra materials and lights

- You don't have to seek for material names in Collada files or 3ds max;
- After first load:
  - **hydra\_profile\_generated.xml** have all names and current parameters
    - You may use this file as initial template
    - it located in the scene folder
    - When load scehe from .vsgf, this file is used, not hydra\_profile.xml;
    - If you used hydra earlier some old scenes may not work due to that. Just copy hydra\_profile.xml to hydra\_profile\_generated.xml

# Hydra materials and lights

- When you press “Save button”
- All material and lights parameters will be reloaded immediately!
- You don't have to press “restart” unless you changed textures, or add new lights.
- Also you have to press “restart” if you changed position of spherical, area or mesh light (because BVH have to be reconstructed)
- **hydra\_profile\_generated.xml** have all names and current parameters