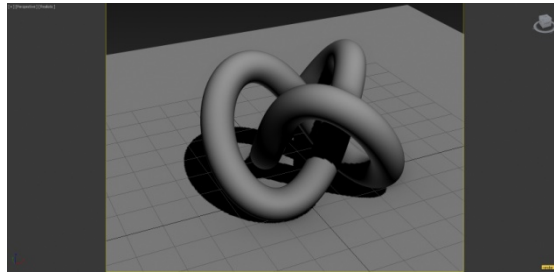


1. Mental Ray lights

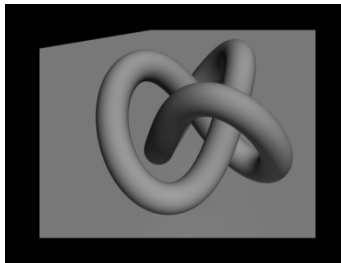


Render Setup / u dijalog prozoru izaberi Common / Assign Renderer

Production/ Default Scanline Renderer

izaberi NVIDIA mental ray

Render



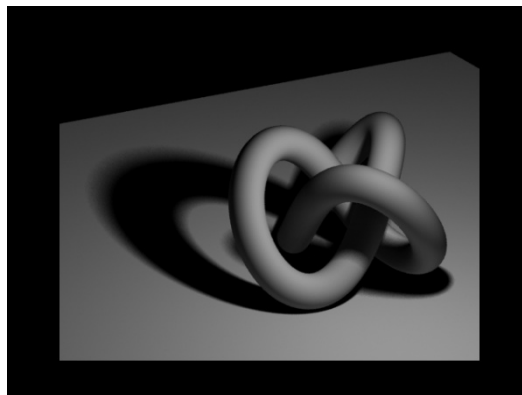
Kreiranje svetla

Create / Lights / Standard

mr Area Omni,

mr Area Spot, mr = Mental Ray

izaberi mr Area Omni / postavi svetlo / Render

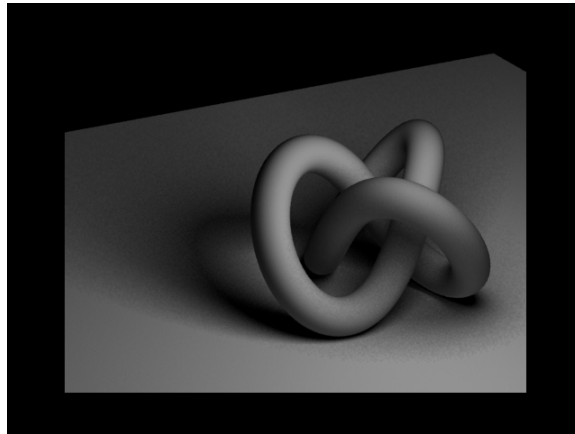


Modify / Shadows / Ray Traced Shadows

izaberi sada dole: Area Lights Parameters, radi pravljenja mekših senki

Type: Sphere / Radius, variraj ... 20

Samples: U, V, variraj...10



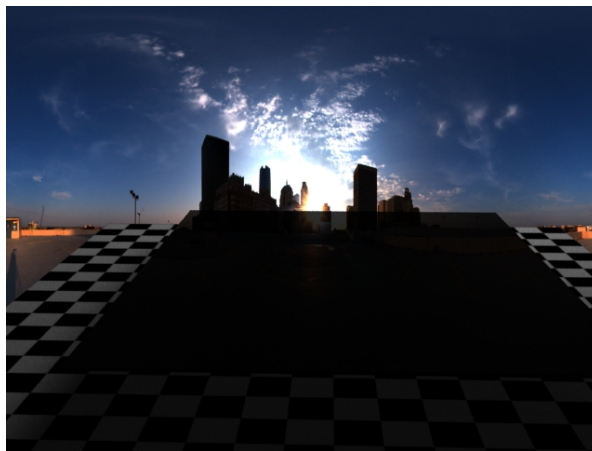
Obriši mr Area Omni Light i stavi obično Omni Light,

Render...ivice senke su oštre

Utilities / MAX Script / Conver to mr Area Light

2. Arch and Design material

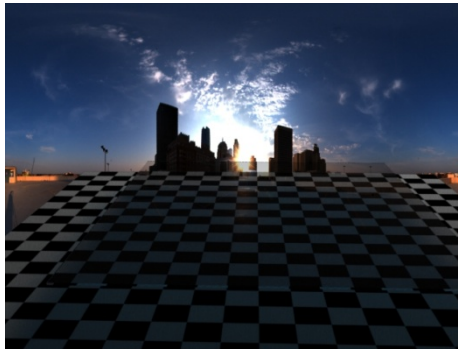
Slovo M... Slate Material Editor



Kod materijala Mental Ray/ prevuci udesno / selektuj prozor #Material

Razni slučajevi:

1. Reflectivity = 0 ... mat materijal, bez sjaja
2. Diffuze Level = 0, ali je
Reflectivity = 1
tada se sve reflektuje i nema uticaja osnovne boje na boju materijala
3. Diffuze Level = 1,
Reflectivity = 1
imamo obe boje...
4. Glossiness = 1
Znači da nema zamućenja (Blur-a) u reflektovanoj slici
5. kada smanjujem Glossiness, recimo Glossiness = 0,3
tada mi raste šum na reflektovanoj slici i moram povećati
Glossy Samples (...=10), a to dramatično povećava vreme renderovanja ali i smanjuje
šum
6. Refraction...
Diffuze Level = 0
Trasparency =1
...staklo!!!



7. IOR - Index of Refraction
IOR=1 tada nema refrakcije!
IOR = 1,3 za vodu
IOR = 1,5 za staklo
IOR = 2 za dijamant
IOR = 1...2
8. BRDF = **bidirectional reflectance distribution function**
Custom Reflectivity Function
0 degree reflection = 0,2
90 degree reflection = 1
Ako gledamo pod uglom od 90 stepeni posmatranu ploču, tada nećemo primetiti
releksiju (vrednost 1). Ako se gleda u dno bazena sa skakaonice odozgo, onda je mala
refleksija, videćemo dno bez deformacija.
9. Kada je čekirano...by IOR (fresnel reflections), tada se refleksija računa prema fizičkim
zakonima.

3. Simulating Indirect Lighting using Global Illumination=GI

Render Setup / Assign Renderer / Production= NVIDIA mental ray

Render.... Final Gather Precision isključi (stavi na nulu)

selektuj svetlo / Lights, Standard / Modify, mental ray Indirect Illumination

Render Setup / Indirect illumination / Caustics and Global illumination

Global illumination, Enable čekiraj

Energija fotona opada sa rastoanjem, zato treba proveriti dimenzije sobe , Utilities / Measure

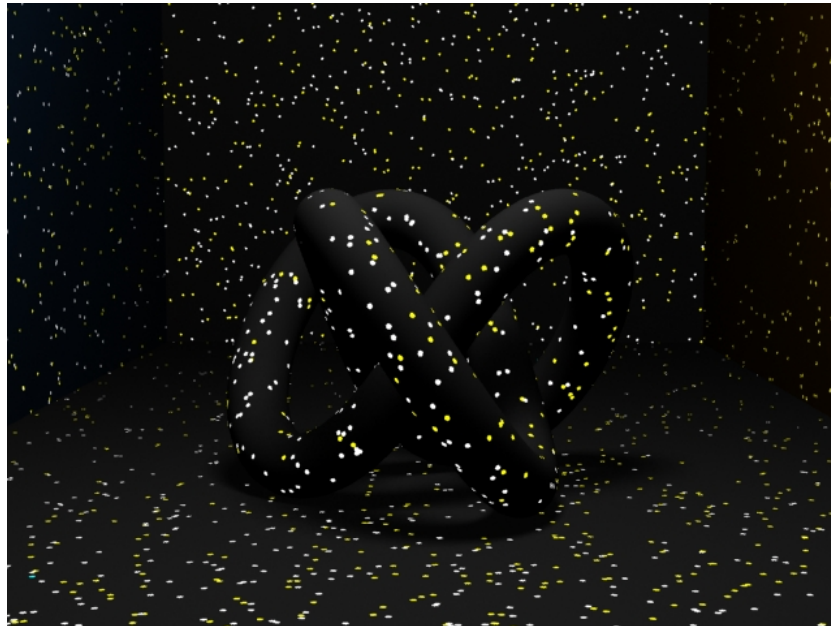
Intensity / Multiplier = 7, Type: inverse square... Render



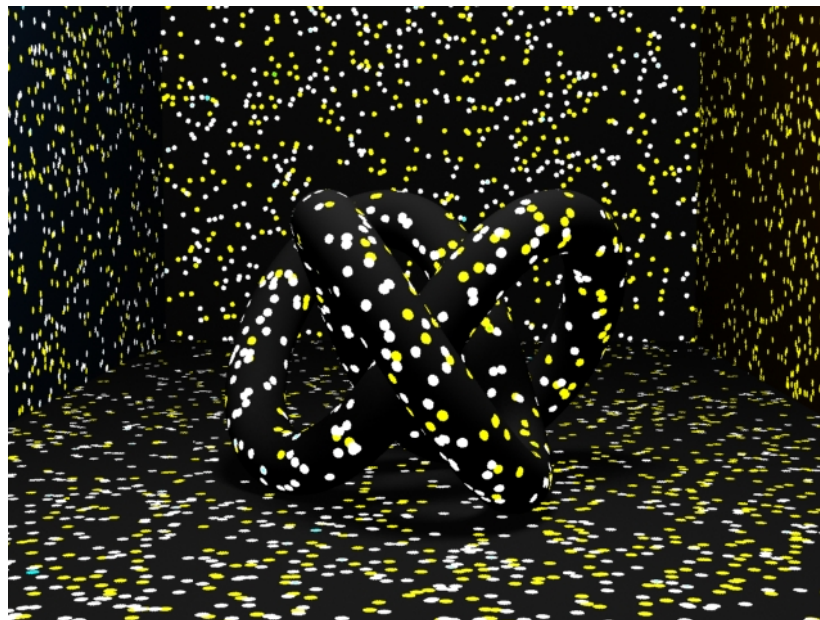
vidljivost fotona korišćenjem GI

4. Exploring the GI parameters

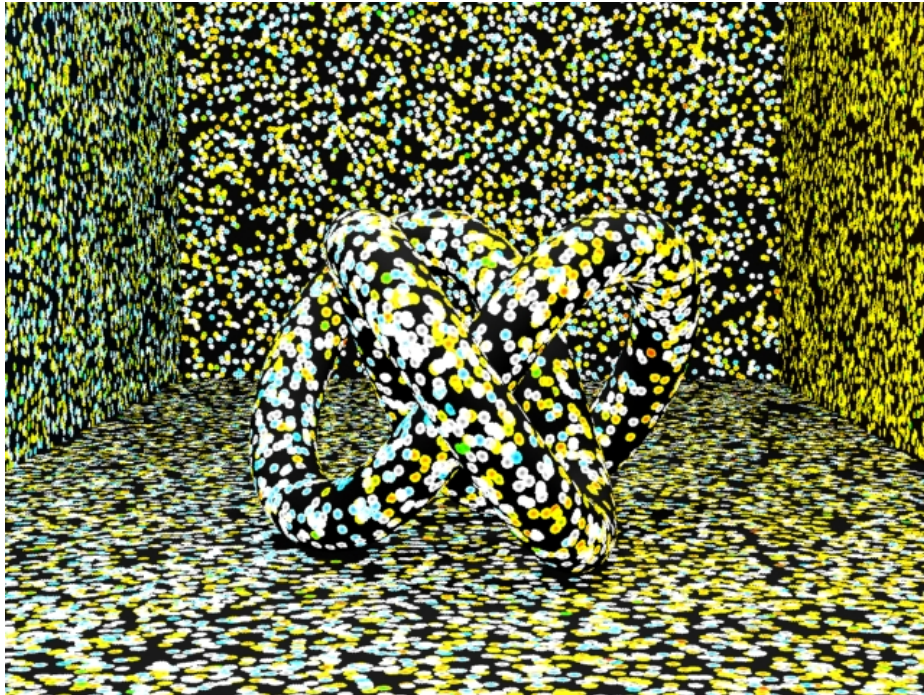
selektuj svetlo / Modify / mental ray Indirect Illumination
zatim Render Setup / Indirect Illumination / Global illumination / Render
čekiraj Maximum Sampling Radius...



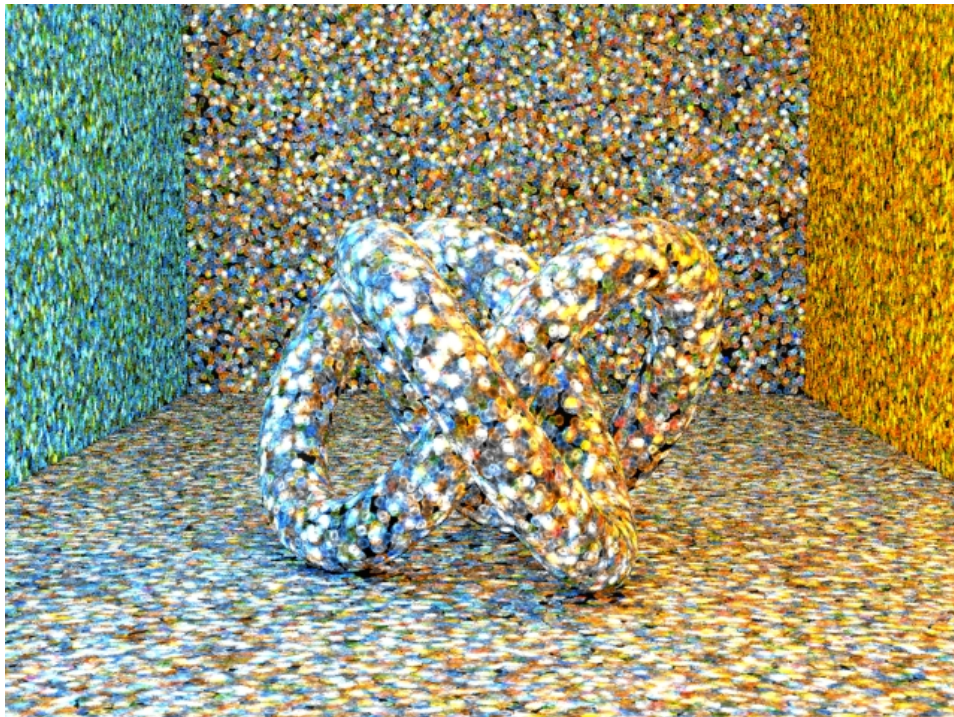
Maximum Sampling Radius = 0,5; Averagi GI Photons per Light = 20000



Maximum Sampling Radius = 1; Averagi GI Photons per Light = 20000



Maximum Sampling Radius = 1; Averagi GI Photons per Light = **100000**



Maximum Sampling Radius = 1; Averagi GI Photons per Light = **500000**



isključi Maximum Sampling Radius; Averagi GI Photons per Light = 500000

Tada je svaki foton prosečna vrednost 500 susednih fotona, zbog vrednosti (Maximum Num. Photons per Sample = 500)

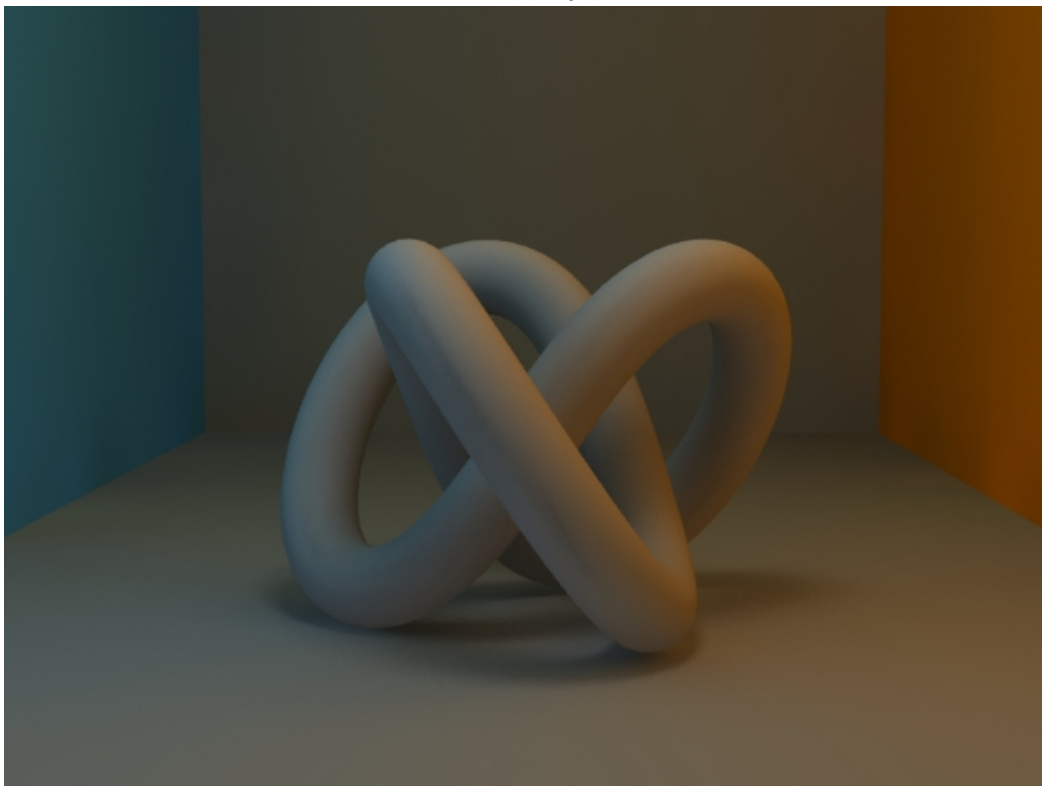
Napomene:

- Maximum Num. Photons per Sample = 500
Foton ima srednju vrednost 500 susednih fotina
- Maximum Sampling Radius = 1
Prečnik kruga unutar kojeg se posmatraju fotoni je 1 cm
- Averagi GI Photons per Light = 20000
Broj fotona na jednom svetlu je 20000
- Energy=1
Svetlo emituje 100% energije
- GI Photons =1
Koristi se 100% fotona od ukupnog broja Averagi GI Photons per Light
- Decay=2
Ovo je vrednost parametra opadanja intenziteta svetla koja odgovara prostiranju svetla u prirodi

5. Simulating indirect Lighting using Final Gather



FG disabled (isključen FG)



FG= low

Kod FG se meri;

- rastojanje od tačke do druge površi
- osvetljenost te druge površi
- boja površi

Ovaj algoritam je lažnjak i ne zasniva se na realnim fizičkim zakonima prostiranja svetlosti.

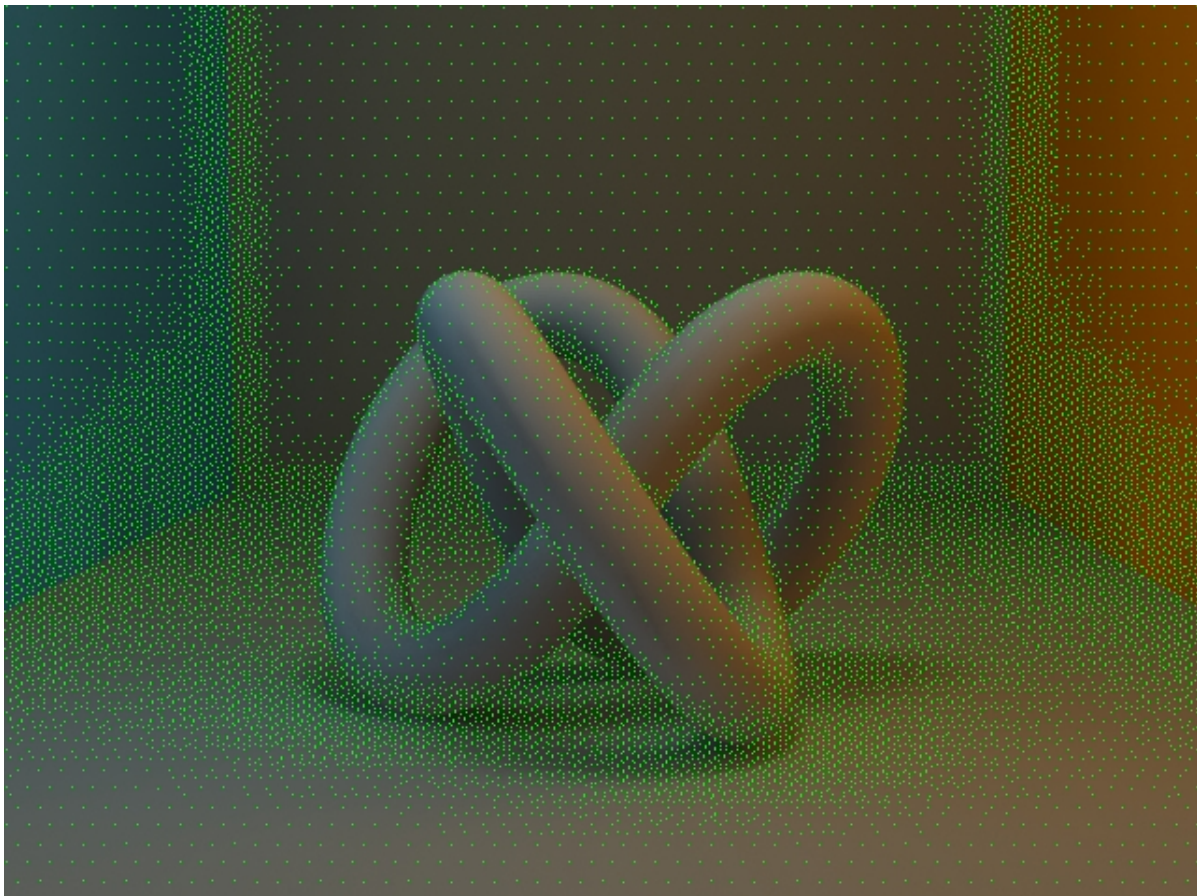
Parametri FG

Initial FG Point Density = 0,4 gustina tačaka

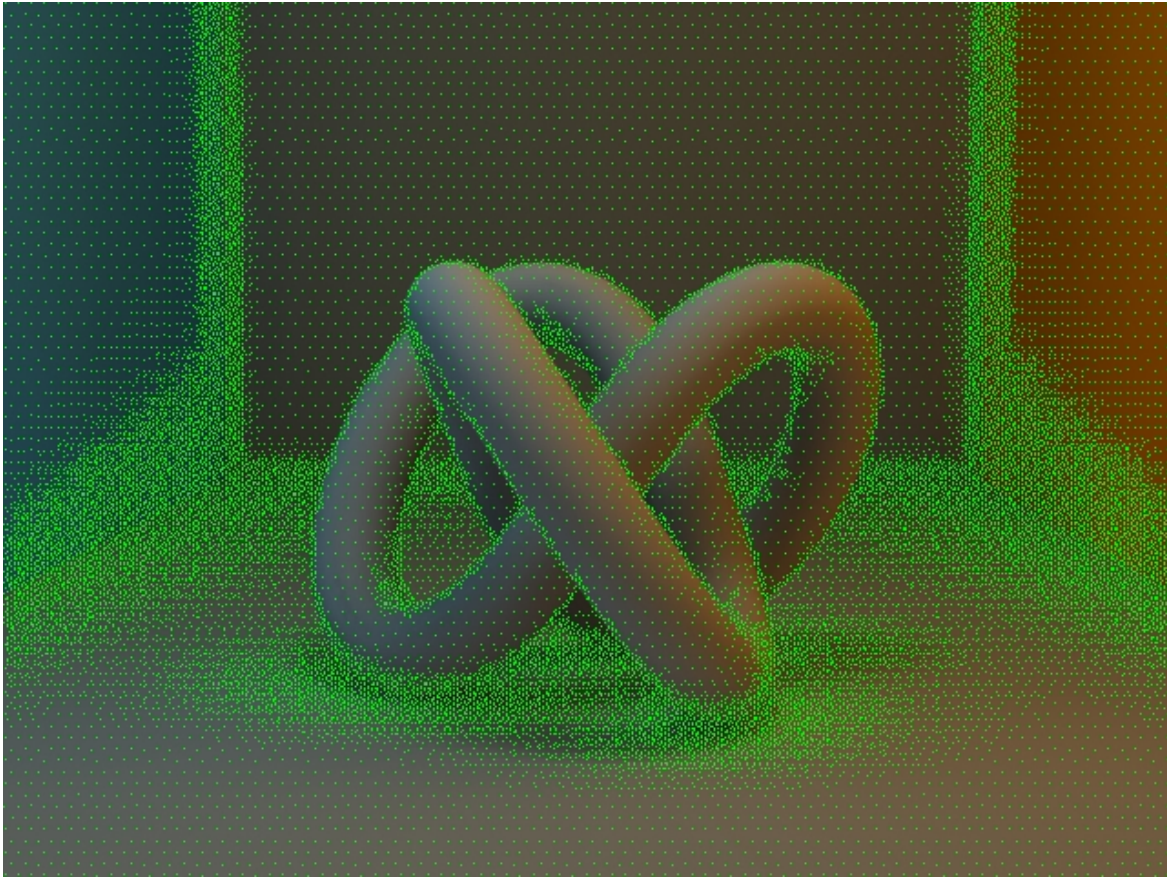
Rays per FG Point = 150 broj zraka koji polaze iz posmatrane tačke

Interpolate over Num. FG Points = 30 broj okolnih tačaka za usrednjavanje vrednosti

Render Setup / Processing / Diagnostics / otkači Enable, izaberi Final Gather / Render
Pokazaće se tačke na ekranu koje tretiraju FG.



Initial FG Point Density = 0,4

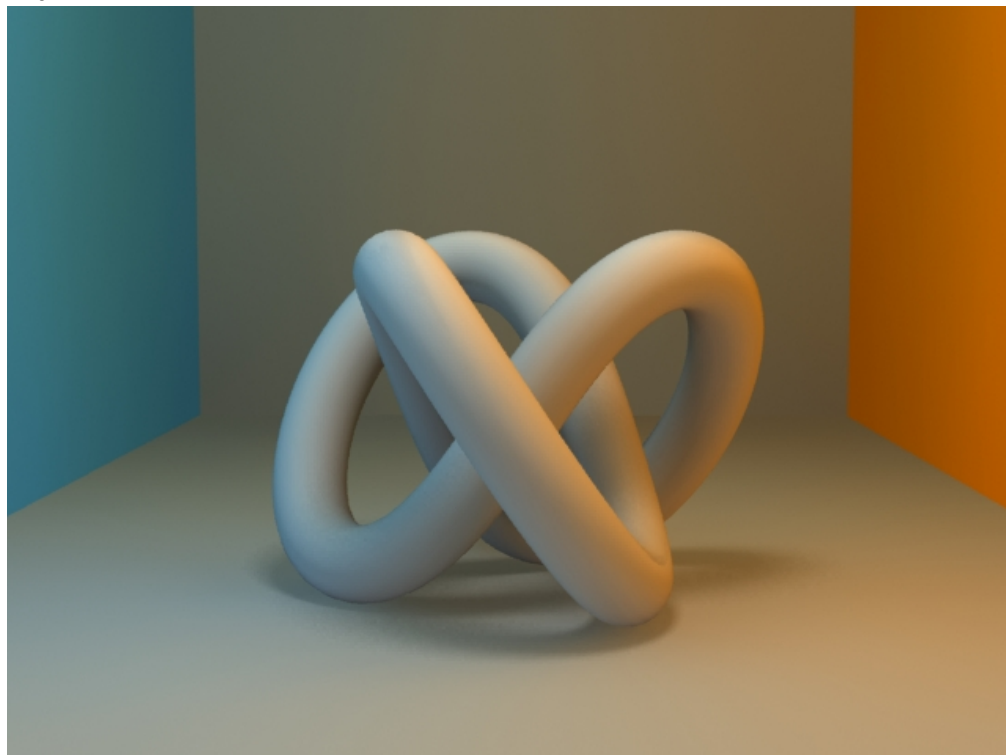


Initial FG Point Density = 1

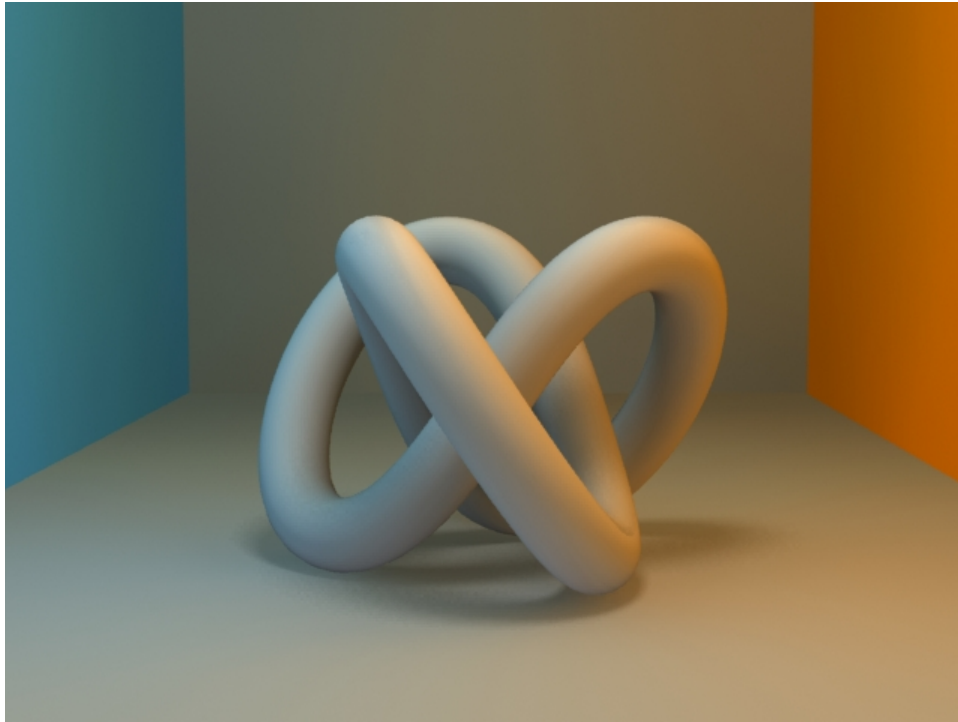
6. Using Final Gather and Global Illumination together



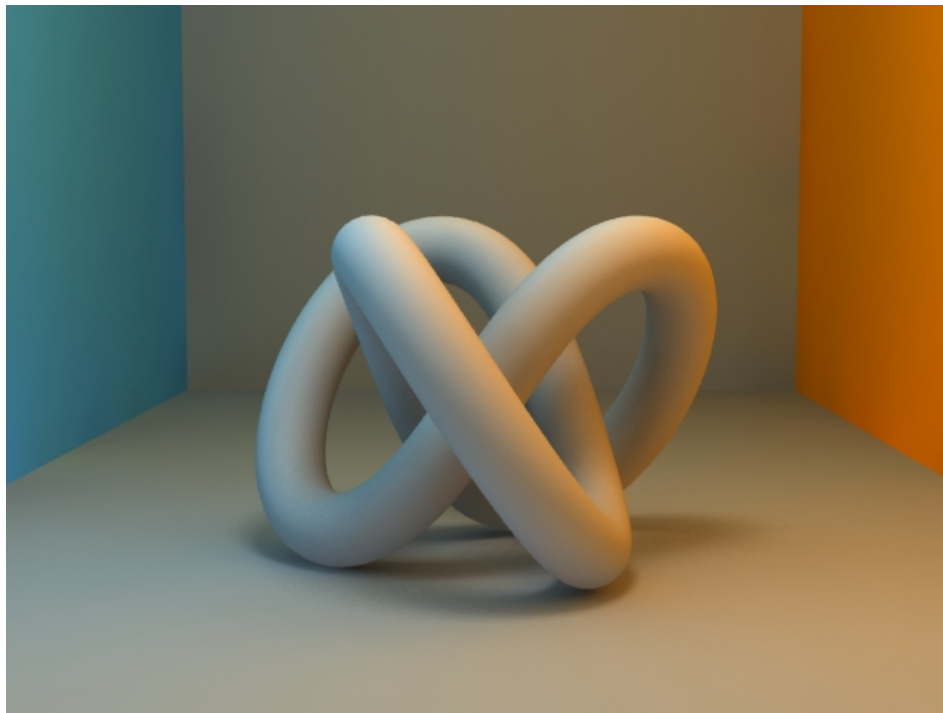
Render / uključi FG na Draft / Render



Render Setup / Indirect Illumination / Average GI Photons = 50000... smanjio sam

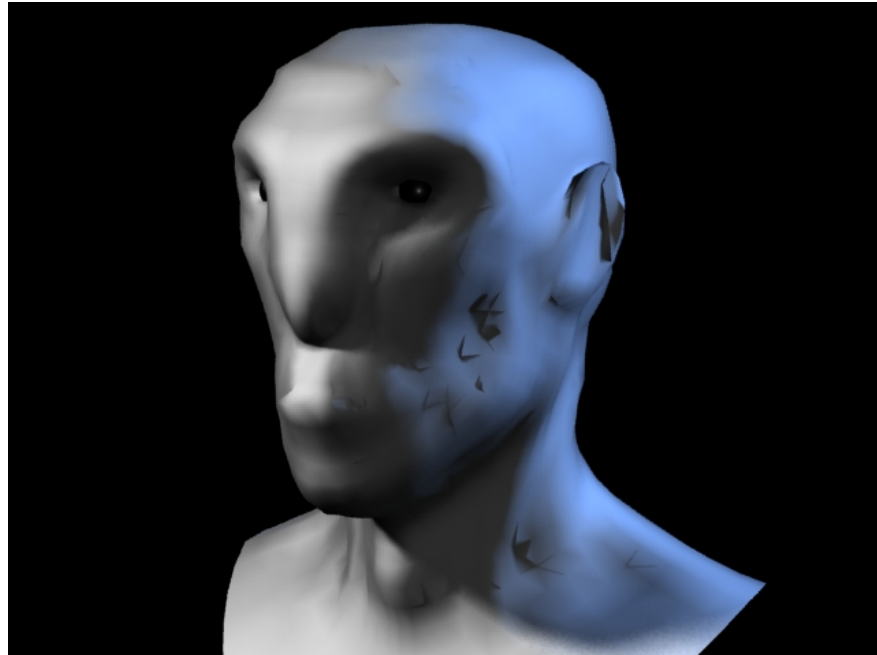


Render Setup / Initial FG Point Density = 1; Rays per FG Point = 200 / Render

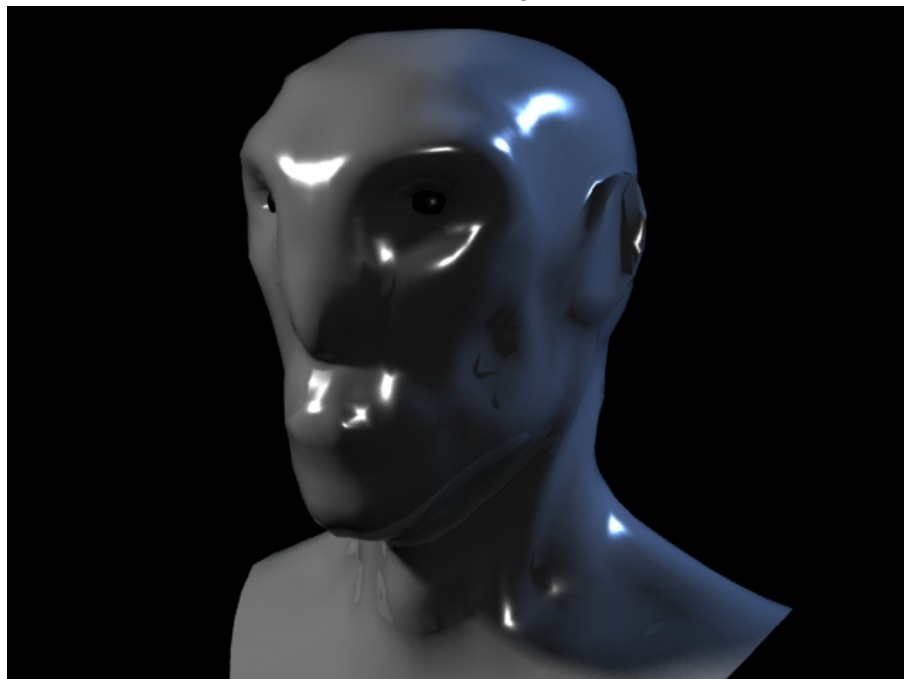


7. Rendering Displacement maps in Mental Ray

glava karaktera / M / izameri Mental Ray, pa Arch and Design / selektuj 2x da bi otvorio dijalog prozor



Selektuj glavu karaktera / desni klik na Material, Assign Material to Selection / Render



Selektuj M / Reflection, čekiraj Highlights + FG / Reflectivity = 0,3, Glossiness = 0,4, Render



Primena Displacement maps

Prozor M / mr Connection / izaberi Displacement, povuci i izaberi 3D Displacement
Dvoklik na Map#0, 3D Displacement / izaberi Extrusion Map, izvuci Standard i Bitmap / Izaberi
fajl DisplacementMap.exr / Open, OK

(A file with the EXR file extension is an OpenEXR Bitmap file)

Izaberi M / mental ray Connection / Extended Shaders, čekiraj Displacement



Korekcija 3D mape

selektuj glavu karaktera / Modify / Use NURMS Subdivision, Render
NURMS = non uniform rational mesh smooth



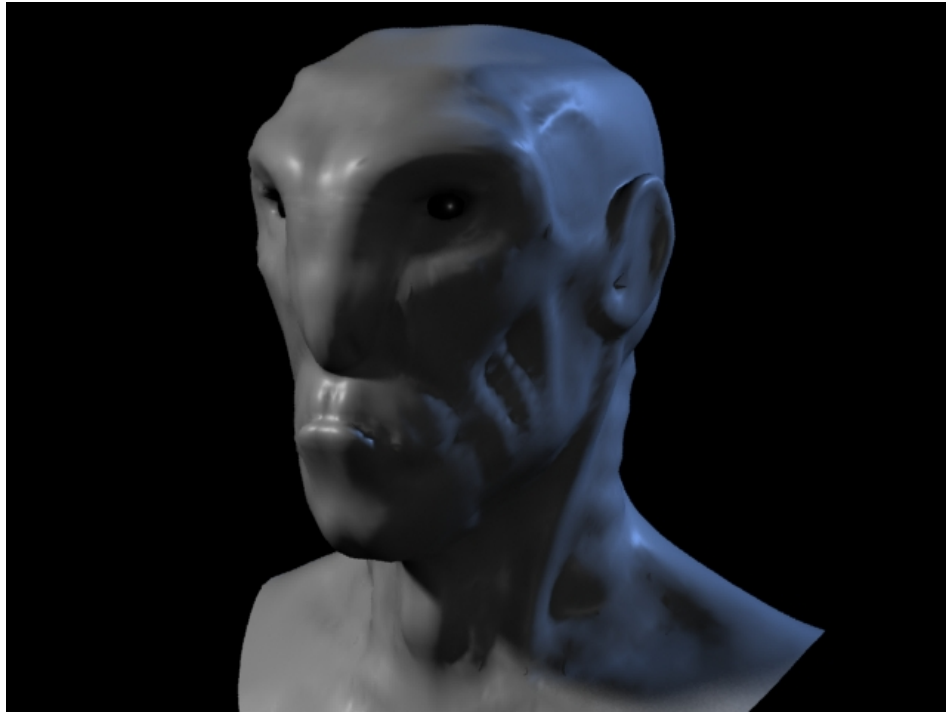
Selektuj Map#1, Bitmap / Output, postavi RGB Offset = -0,5, time se pravi kontrast, da sve što je 50 % sivo, postane crno, čime se mapa pojednostavljuje. Ako je mapa "korektno" podeljena na crno-bele zone, ovo ne treba raditi.

Selektuj glavu / desni klik Object Properties / mental ray, Use Global settings

Edge Length = 2

Max. level = 6 (ide do maksimalno 7)

Ovo znači da softver deli Meshili 6 puta ili tako dok ivica ne bude dužine 2 piksela, pa koji se uslov pre ispuni.



Edge Length = 10

Selektuj Map#1 Bitmap / linkuj sa Bump Map / Render, na ovaj način se ističu detalji na mapi.



8. Image based lighting

hdr - *high dynamic range images* is a set of techniques used in imaging and photography to reproduce a greater dynamic range of luminosity than possible using standard digital imaging or photographic techniques.

Uvoženje slike na scenu

padajući meni Rendering / Environment / Background, čekiraj Use Map

None, Bitmap / izaberi sliku Digital Tutors office, dvoklik / Real Pixels, OK, Render

Podešavanje okruženja

Rendering / Environment /

materijal M / sa prozora Environment prenesi Map#0 na prozor Material / dvoklik na Map#0 kod Coordinates, nađi Mapping i izaberi Spherical (umesto Screen)
podešavanjem Offset U=0,2 se slika zakrivljeje u krug, kada je U=1 tada se pravi pun krug!

Dodavanje svetla

Lights / Standard / postavi Skylight / Modify / Use Scene Environment / Render

Posvetljavanje scene i prirodniija slika okruženja

padajući meni Rendering / Gamma LUT Setup / Enable Gamma, tada slika okruženja izgleda prirodnije

On the Gamma and LUT panel of the Preference Settings dialog, you set options to adjust the Gamma and lookup-table (LUT) values for input and output images and for the monitor display.

Gamma Correction

Gamma correction compensates for the differences in color display on different output devices, so that images look the same when viewed on different monitors.

A gamma value of 1 corresponds to an "ideal" monitor; that is, one that has a perfectly linear progression from white through gray to black.

However, the ideal display device doesn't exist. Computer monitors are "nonlinear" devices. The higher the gamma value is set, the greater the degree of nonlinearity. The standard gamma correction value is 2.2. Depending on the monitor, gamma values in the range of 1.5 to 2.2 are common.

Podešavanje senke na podlozi - Fake senka

Materijal M / Selektuj materijal objekta / Special effects / čekiraj Ambient Occlusion / promeni Shadow Color u crnu boju / Render

9. Rendering Caustic light patterns

In optics, a **caustic** or **caustic network** is the envelope of light rays reflected or refracted by a curved surface or object, or the projection of that envelope of rays on another surface.

materijal M / dvoklik na Material# Arch & Design / Templates / Glass Physical / Render



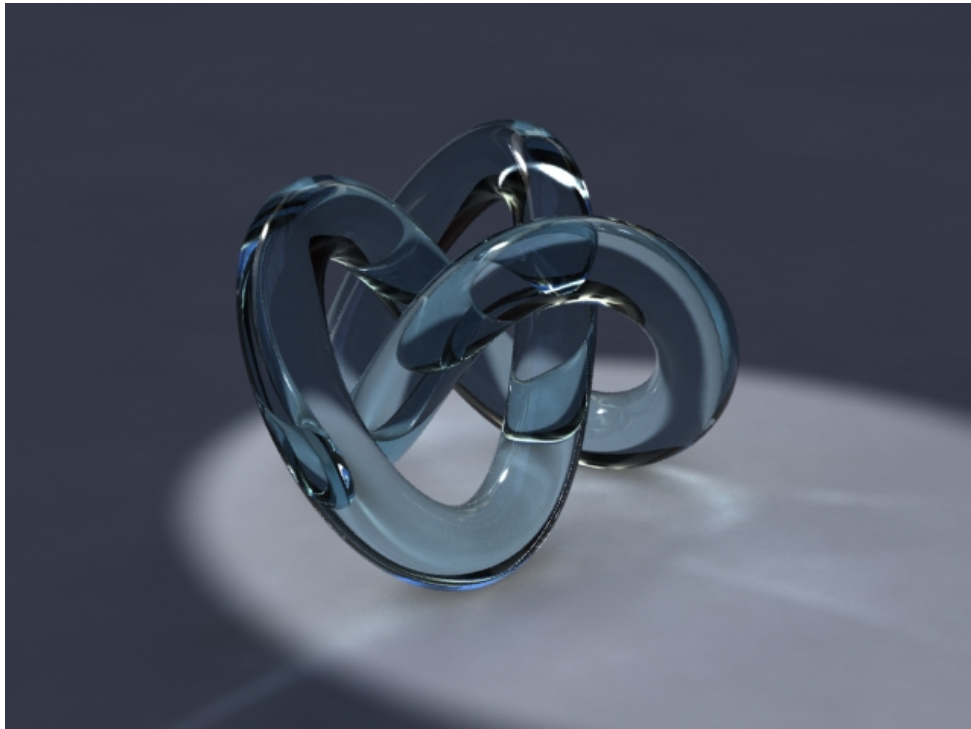
Kreiranje svetla

Lights / Standard / Target Spot (ili free Spot koristiti za kaustiku), stavi u front View
desnik klik na Front / Lights / Spot001

Modify / Spotlight Parameters / koriguj Hotspot i Falloff konuse



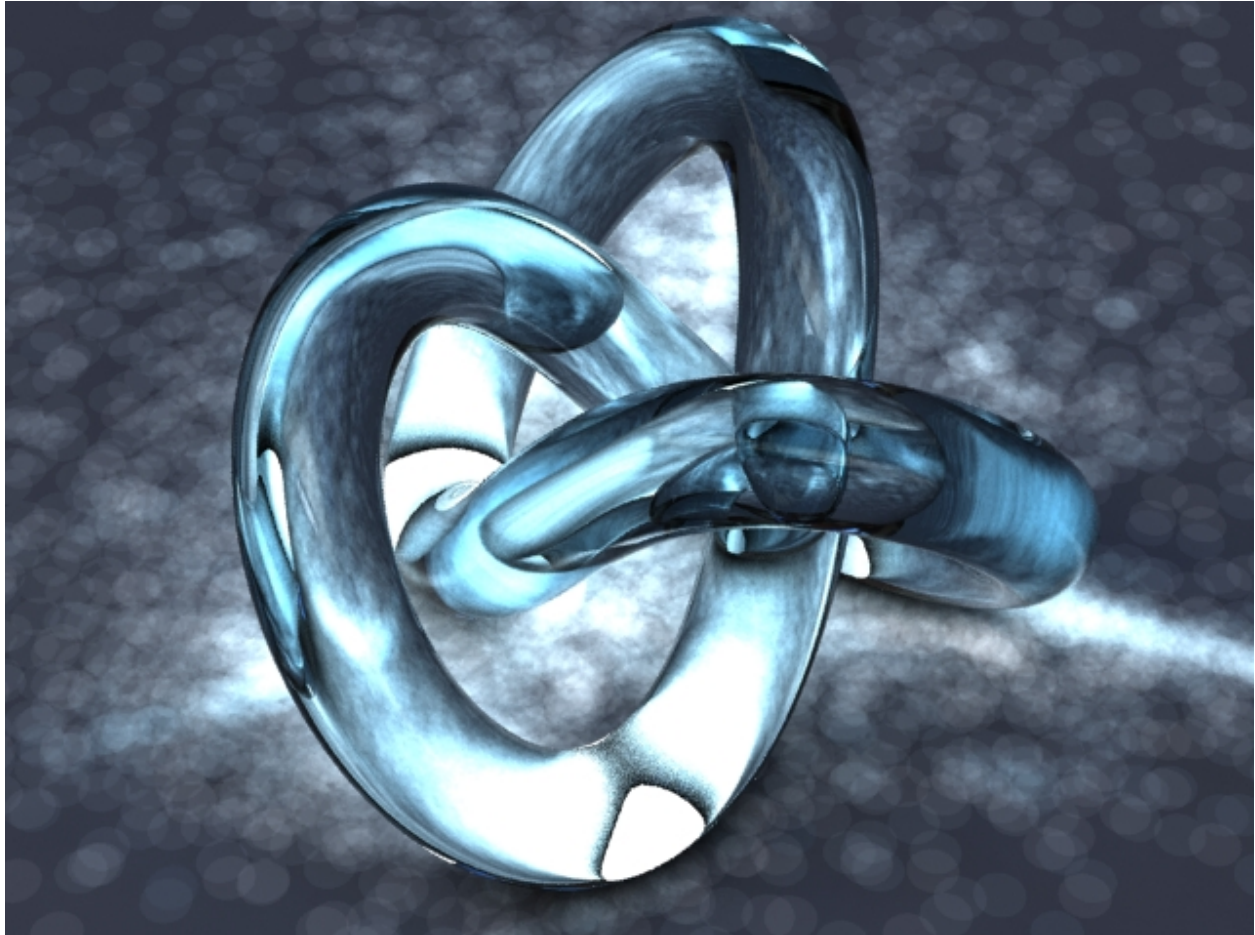
Render Setup / Indirect Illumination / otkači Caustics (Enable) / Render
javlja se greška...There are no Caustic Photons in the scene
selektuj Objekat, desni klik / Object Properties / mental ray / čekiraj Generate Caustics / OK
selektuj Target svetlo, desni klik / Object Properties / mental ray / čekiraj Generate Caustics /
OK... javlja se kaustika, slika dole



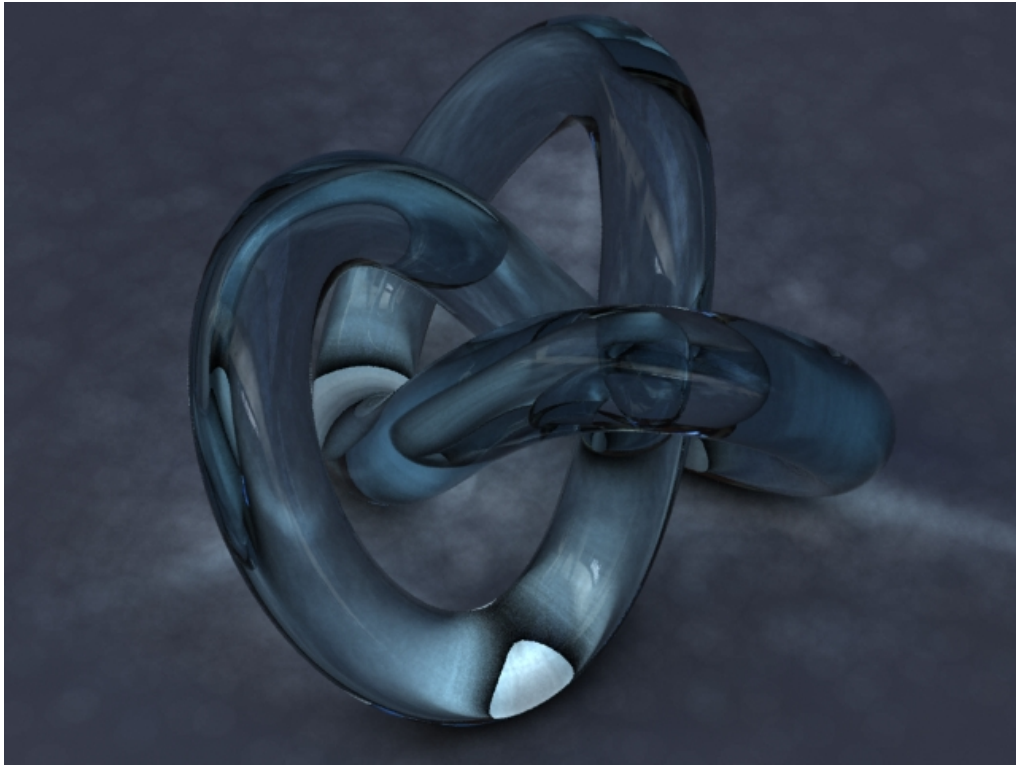
selektuj svetlo / Intensity-Color-Attenuation / Multiplies = 0... tako se eliminiše direktna iluminacija

mental Ray indirect Illumination / deselektuj Automatically Calculate...

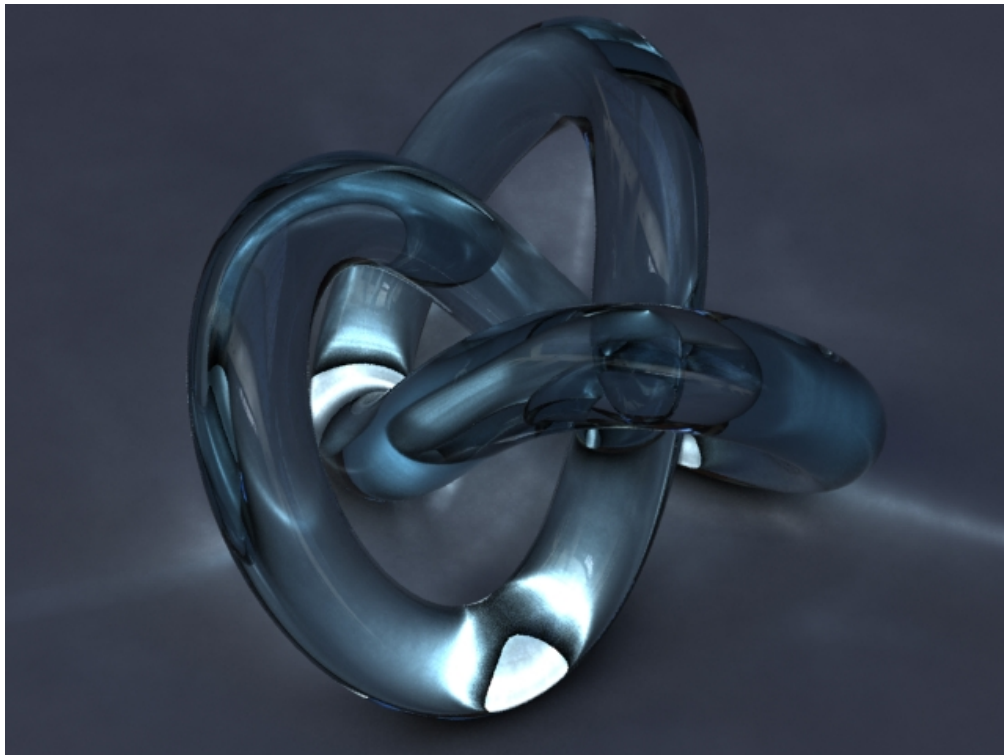
sada smo prešli u Manual Settings, čekiraj On / Render... fotoni su uočljivi



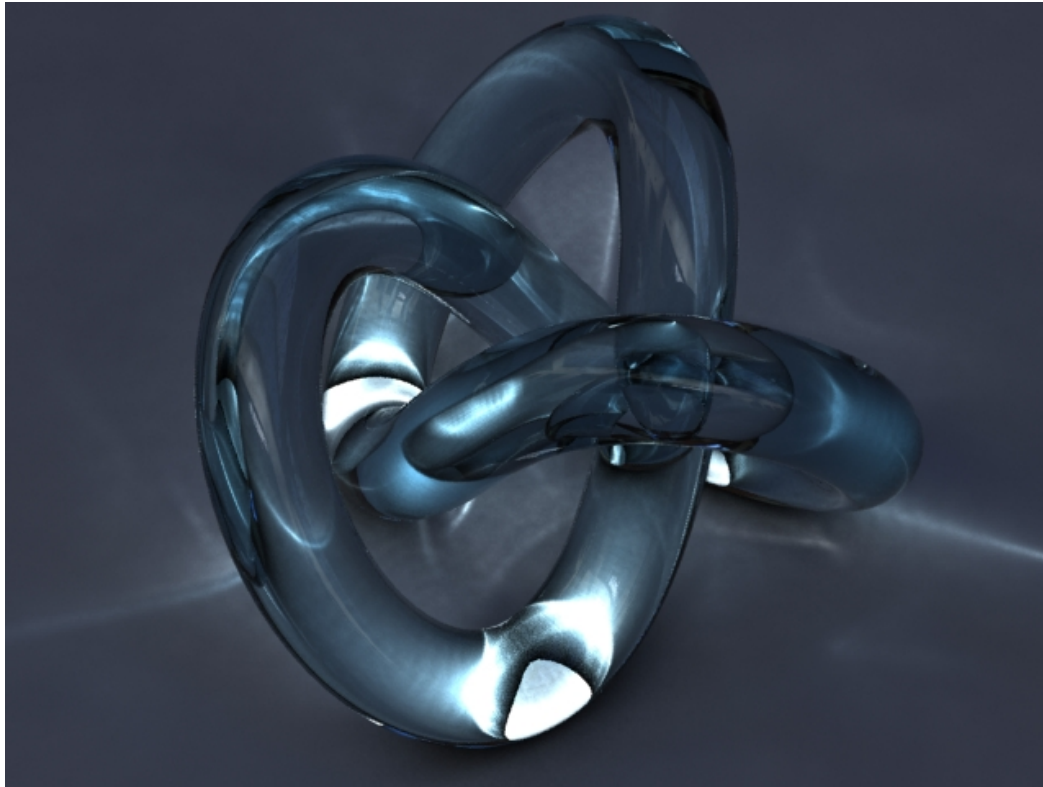
Energy=10000



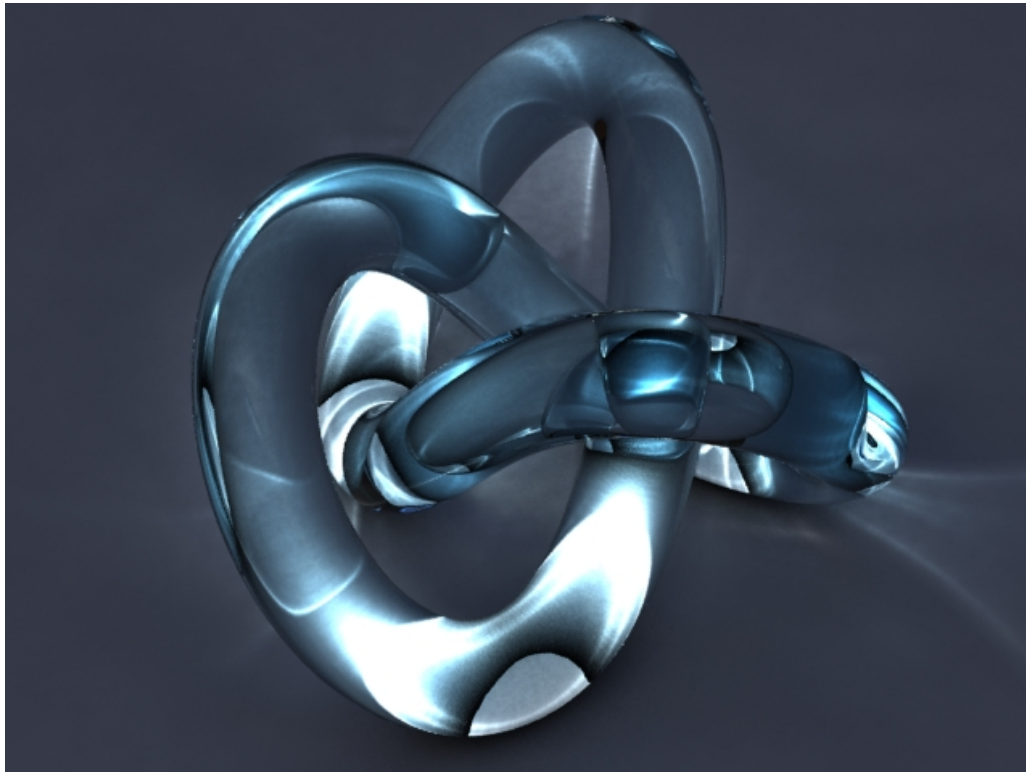
Caustics Photons=100000



Caustics Photons=500000



materijal M / dvoklik na materijal / Refraction / IOR = 1,2



10. Using the Material editor to control Photon appearance

materijal M / izaberi Glass (Physical) / kopiraj materijal (sa Shift) i daj kopiranom ime Kaustika
kod Kaustika stavi IOR=1,2 / Render



Kod Mat#27 (materijal čaše) razmotaj mr Connection / selektuj Kaustika materijal /
Maps - Mental Ray - Material to Shader / spoj Materijal to Shader sa Photon (sa Mat#27)

selektuj Mat#27 / idi dole na mental ray Connection / zatim na Caustic ang GI / otključaj Photon
Clone Renderer Frame / Render



selektuj materijal Kaustika / Advanced Rendering Options / kod Refraction promeni boju Color at Max Distance u crvenu / Render



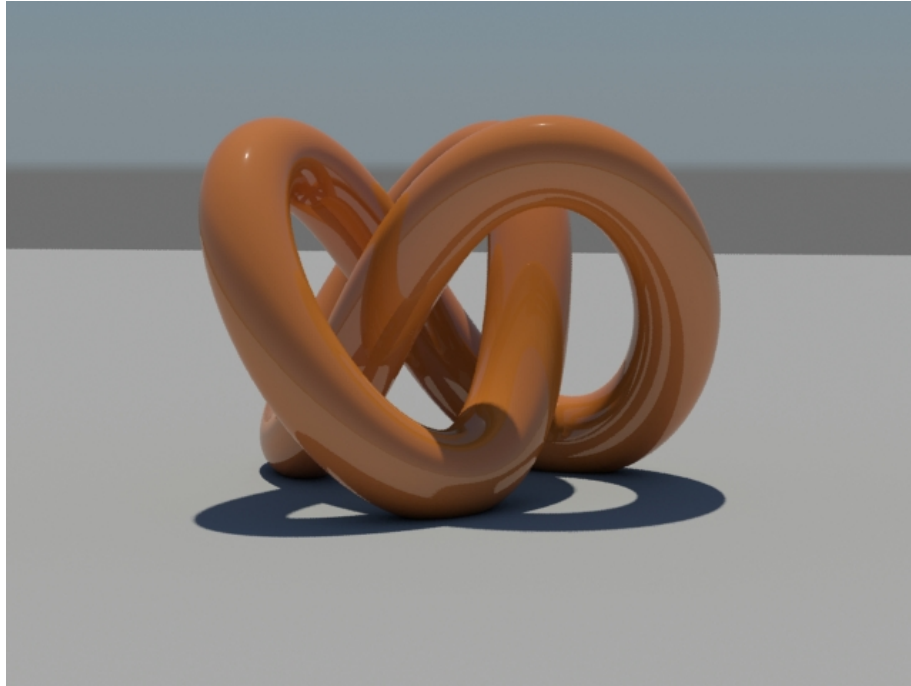
11. Rendering with the Daylight System

Create / Systems / Daylight / Yes

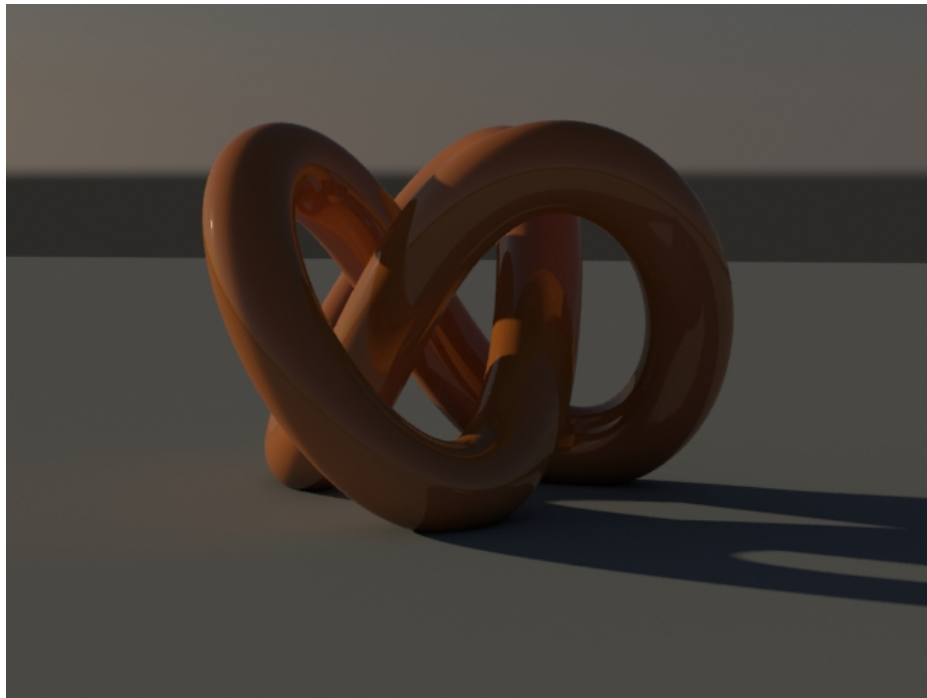
Top View / razvuci... click and drag / Render

Modify / Sunlight ... mr Sun

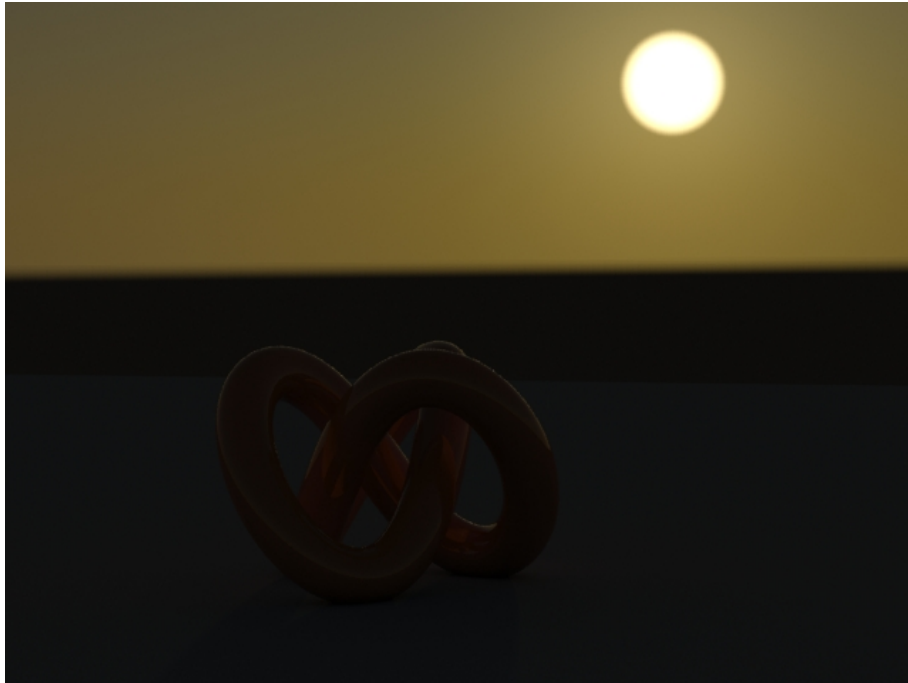
Skylight... mr Sky / Yes / nagni scenu da se vidi horizont, Render



selektuj svetlo / Modify Position / Setup / Hours = 18, North Directions = 180, Orbit Scale / Render

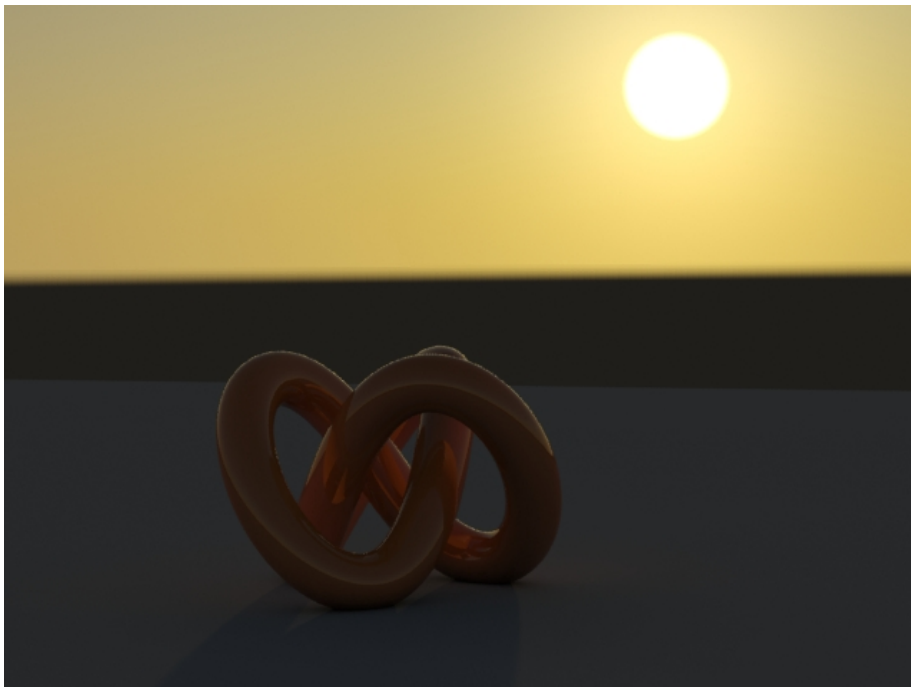


Perspective View / desni klik na Realistic / Viewport Background , Environment Background
podesi Time da se sunce vidi / Render



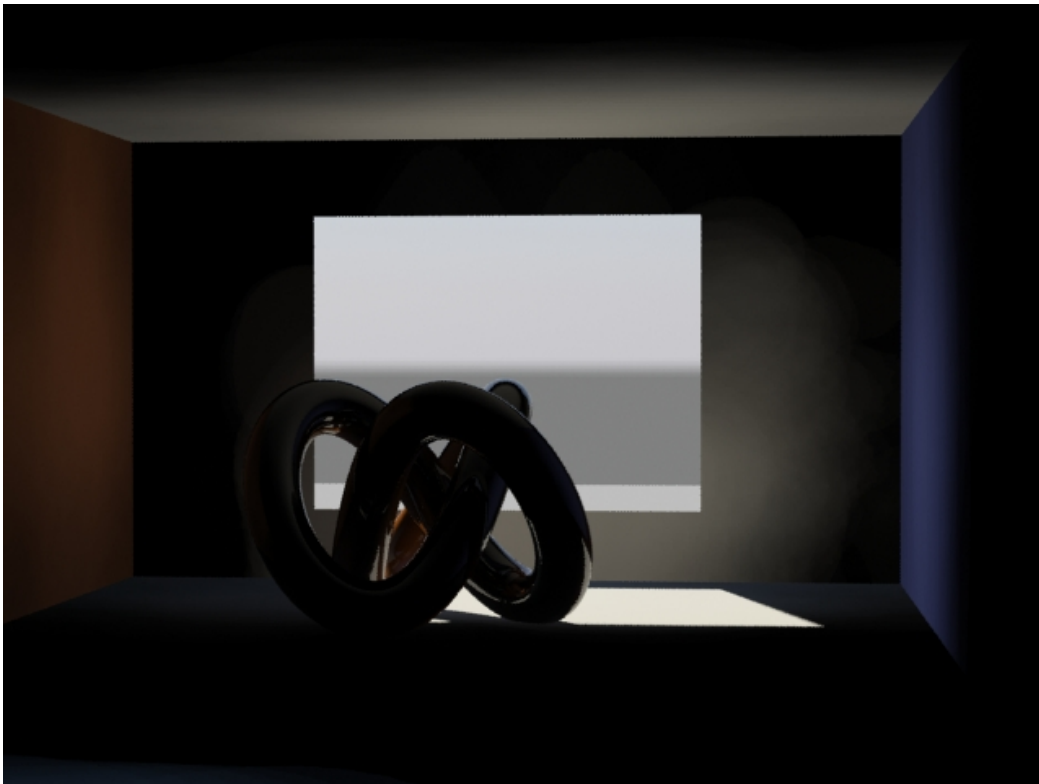
Exposure Value =15

Promeni ekspoziciju / padajući meni Rendering / Exposure Control / čekiraj Process
Background and Environment Map
menjaj Exposure Value / Render / Hours = 15 / Render



Exposure Value =13

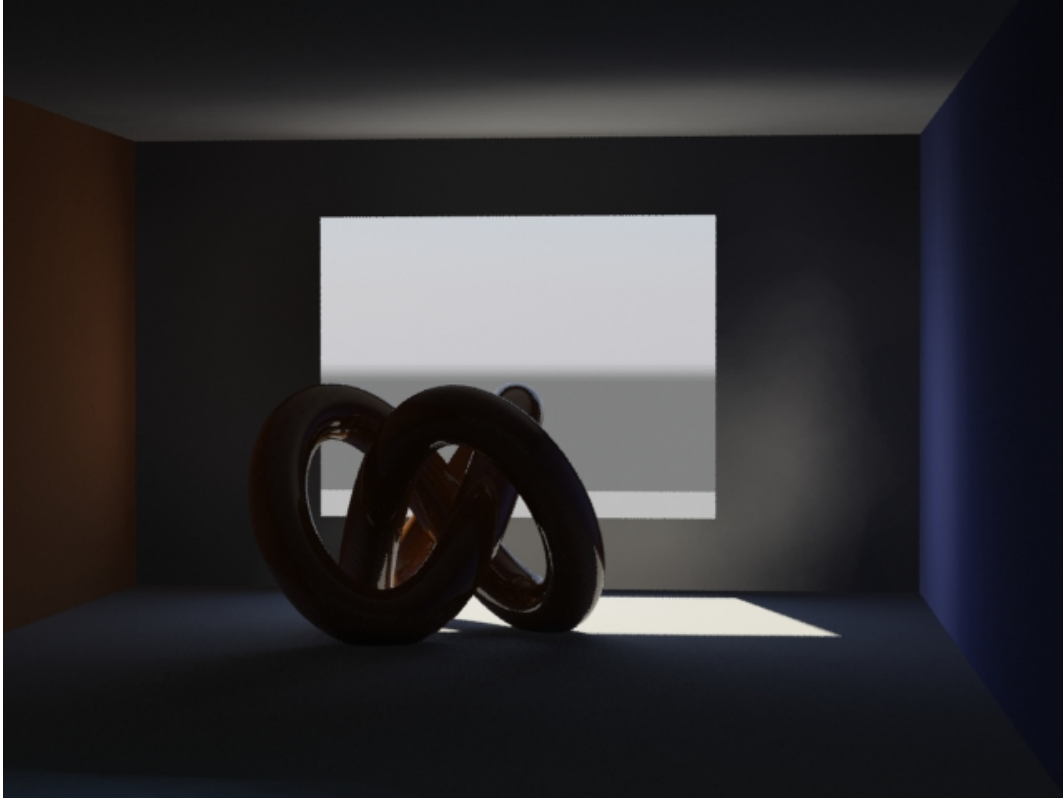
12. Portal Lights



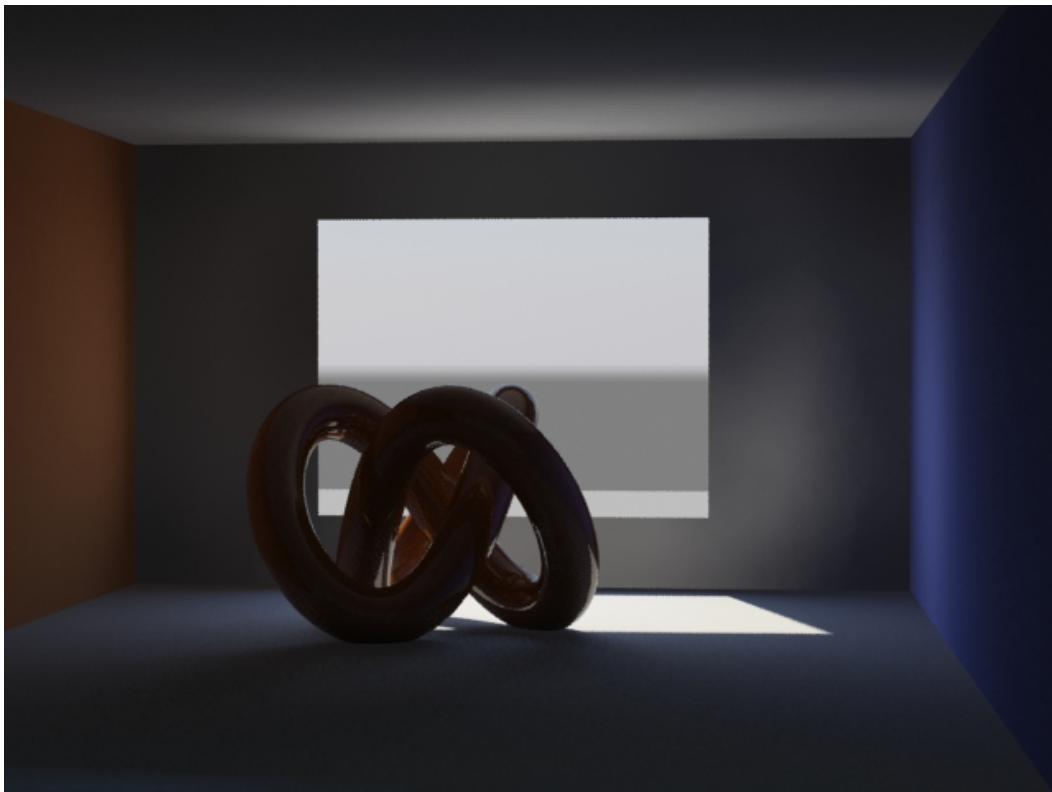
Scena sa uključenim FG = Draft



Scena sa isključenim FG



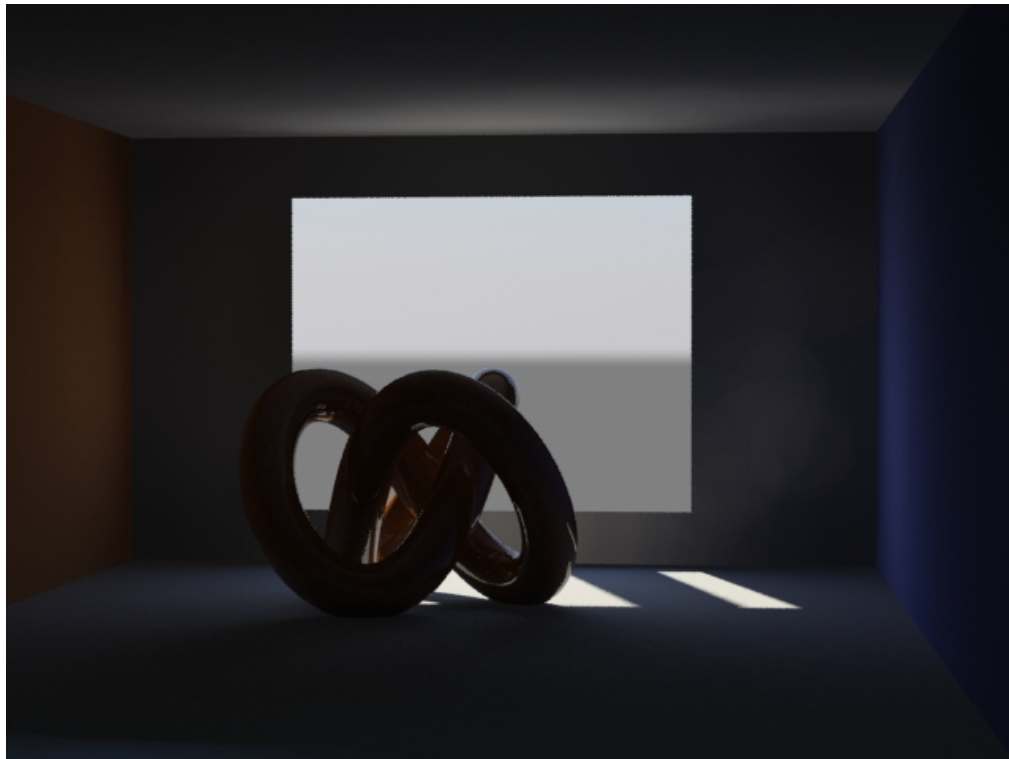
Dodato je Portal Light



Portal Light i Multiplier = 2

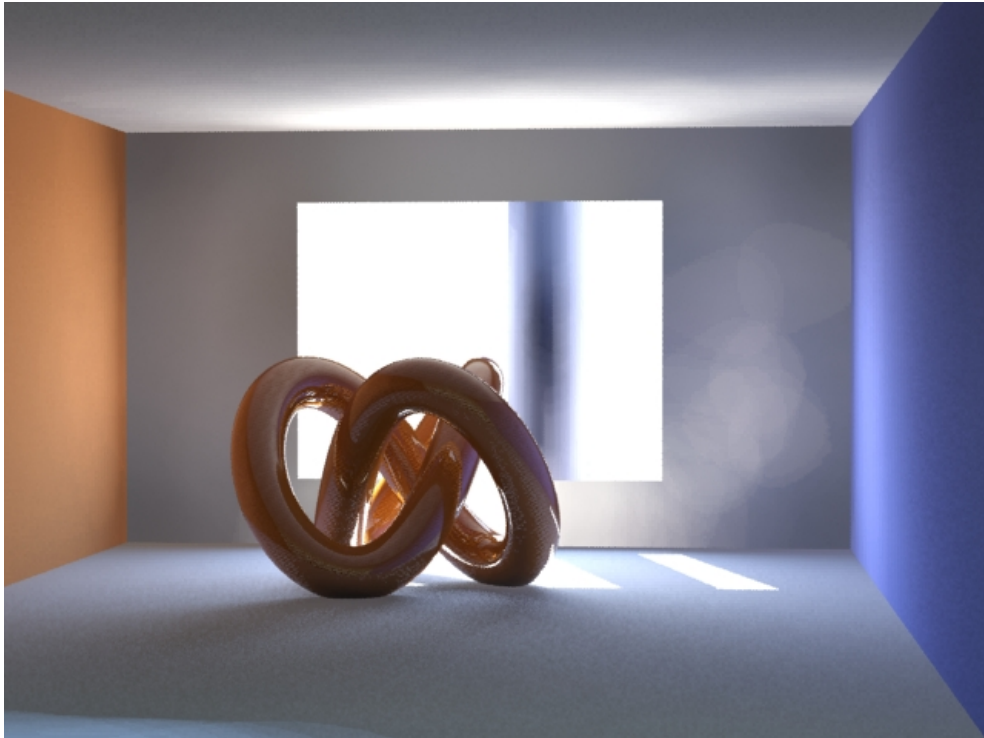


Dodat je cilindar ispred sobe



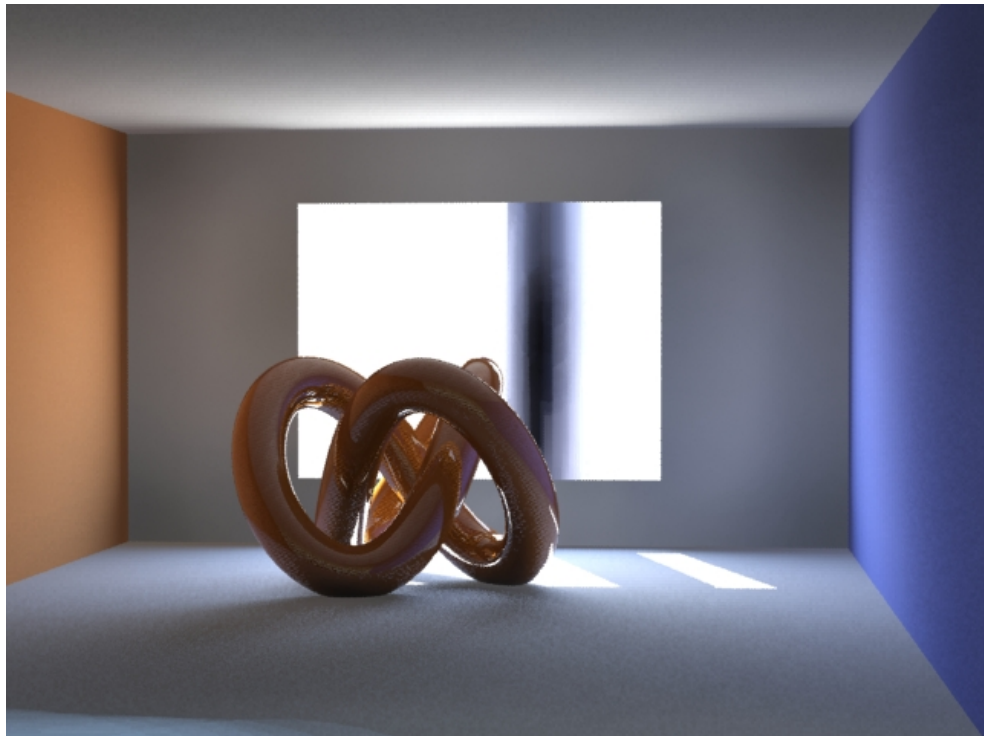
Kod prethodne scene Portal Light je proglašen Visible to Renderer

Rendering / Exposure Control / Preset = Physically Based Lighting Indoor Daylight



Physically Based Lighting Indoor Daylight, scena je previše svetla

Render Setup / Indirect Illumination / Advanced / Noise Filtering = Very High



Noise Filtering = Very High