

# RENDERING

mit Ashlar-Vellum

Cobalt Xenon Argon

[www.arnold-cad.com](http://www.arnold-cad.com)



# Erstellen photorealistischer Darstellungen

## Erstellen Sie Ihre Welt!

- Modellier Tips für mehr Realität
- Hintergrund und Szene
- Betrachtung der Szene
- Perspektive
- Reflektierende Objekte

## Beleuchten Sie Ihre Welt!

- Lichtquellen einrichten
- Licht Farbe, Stimmung
- Schatten
- Leuchtende Objekte
- Fortgeschrittene Beleuchtung

## Verleihen Sie Ihrer Welt Leben!

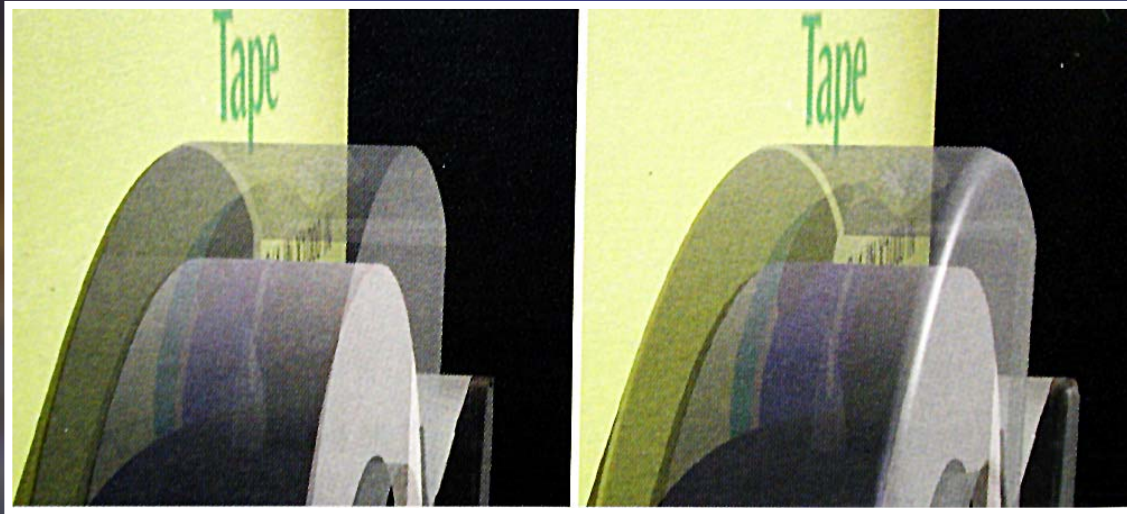
- Materialien
- Arten von Plastik
- Metall
- Glas und durchsichtige Materialien
- Bilder basierte Texturen
- Modellieren mit Texturen
- Transparenz
- Abbilder Decals Tricks und Effekte
- Spezielle und ungewöhnliche Materialien

Erstellen Sie Ihre Welt!

# Modellier Tips für mehr Realität



## Modellier Tip 1 – Verrunden Sie die Kanten



In der realen Welt gibt es beinahe keine scharfen Kanten. Bringen Sie an alle Kanten kleine Radien an. Dies verleiht Ihrem Rendering sehr viel mehr Realität.



## Modellier Tip 2 – Ändern Sie die Auflösung von Objekten auf Superfine



## Modellier Tip 3 – Oberflächen für bessere Kontrolle von Texturen





## Modellier Tip 4 – Modellieren Sie so detailgetreu wie möglich

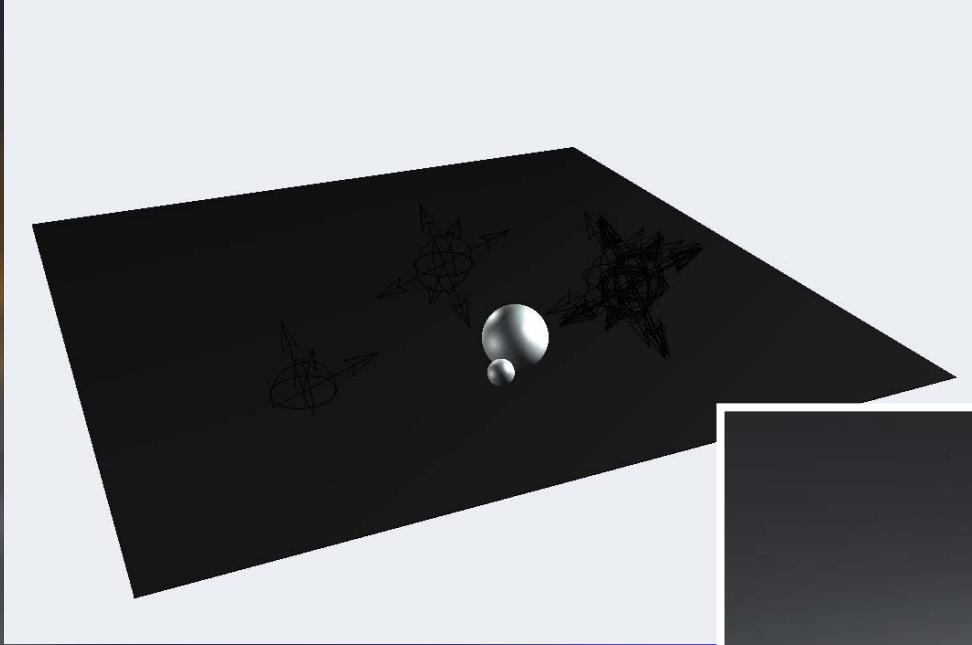


Erstellen Sie Ihre Welt!

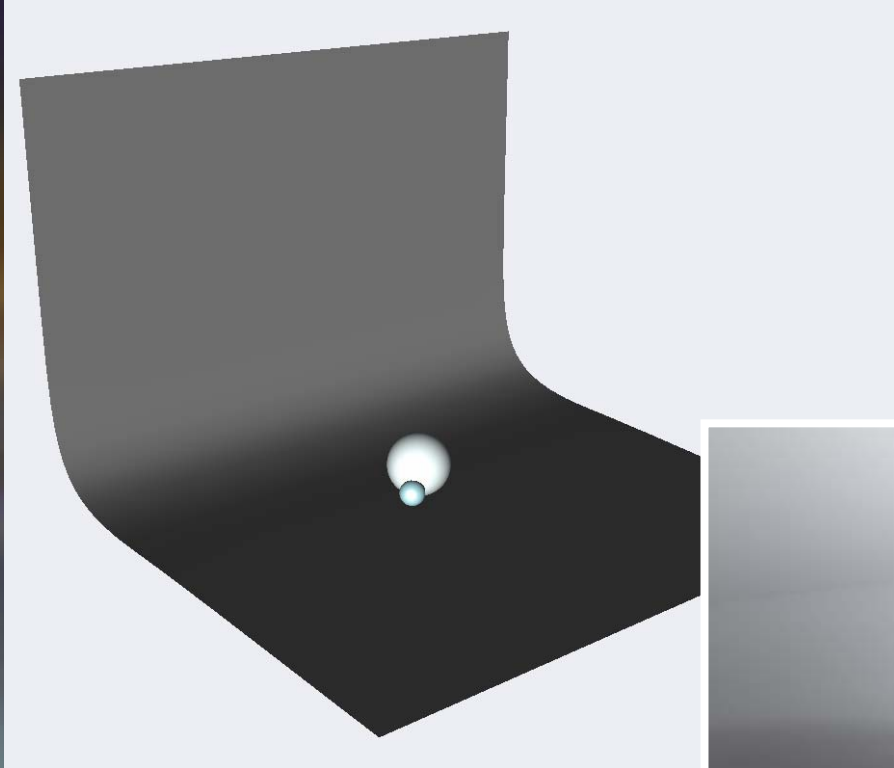
# Hintergrund und Szenen



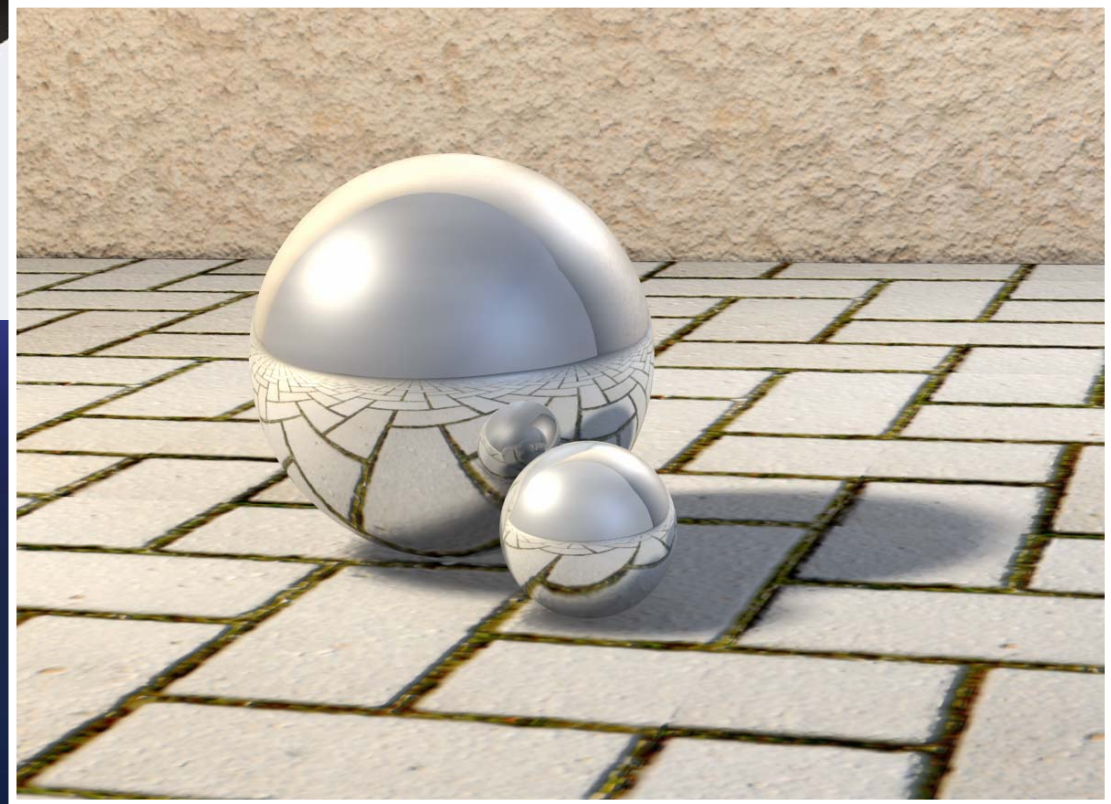
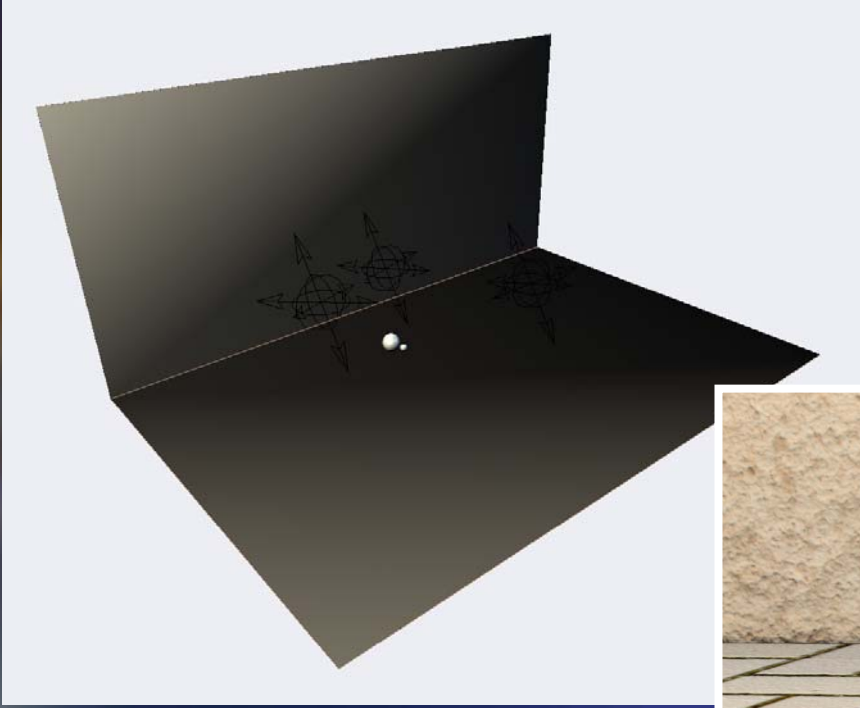
## Hintergrund und Szenen – Einfacher Boden



## Hintergrund und Szenen – Gewölbte Fläche

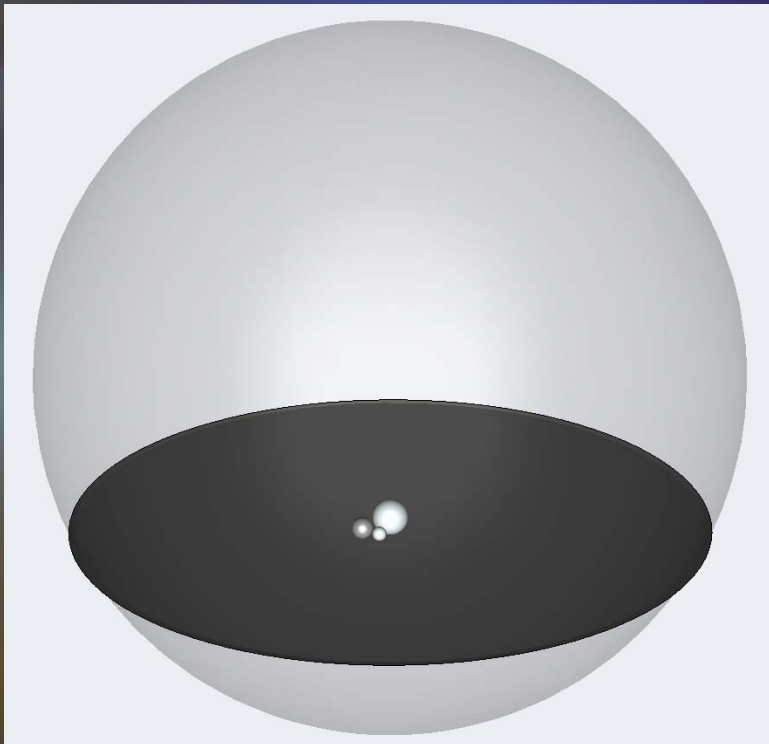


## Hintergrund und Szenen – Boden und Wand

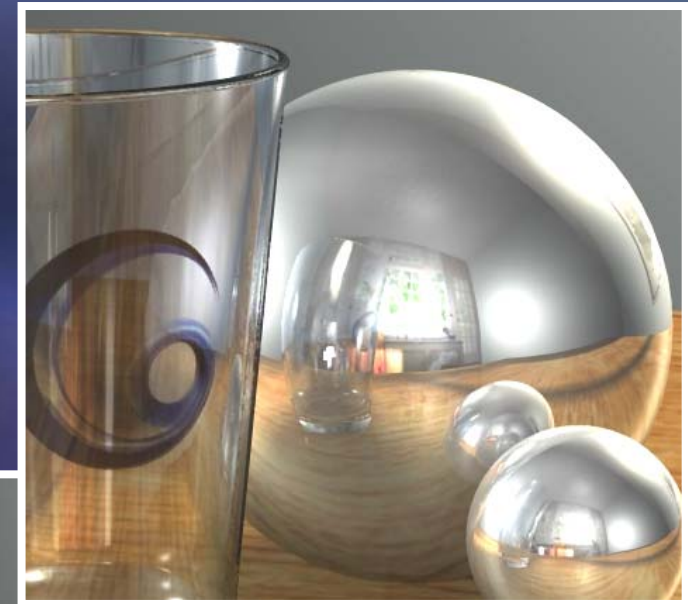
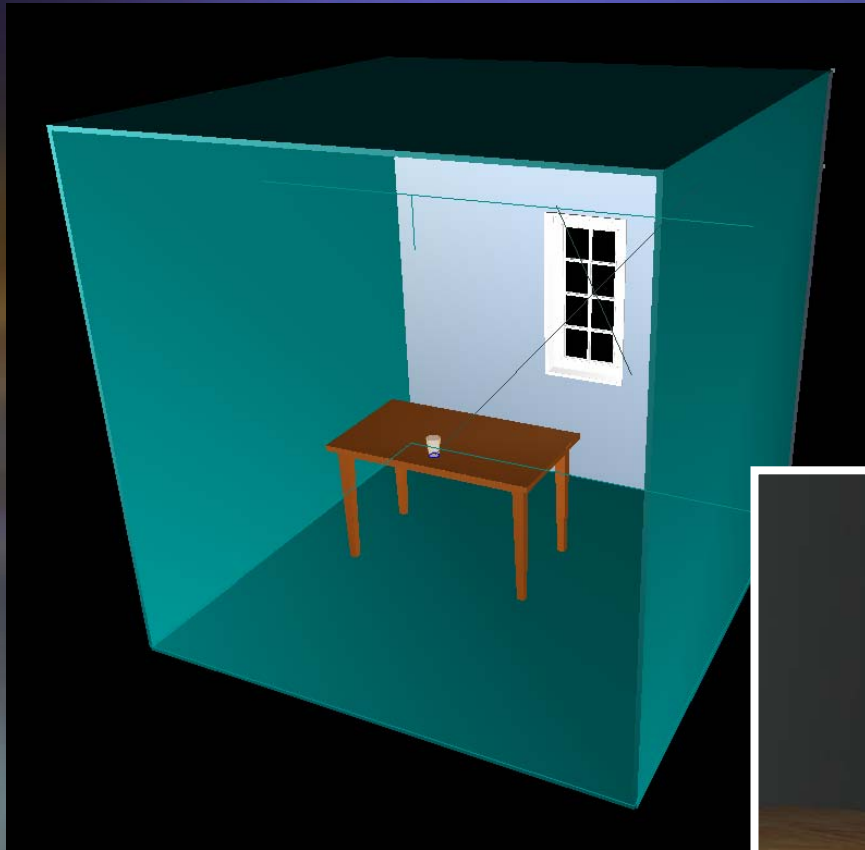




# Hintergrund und Szenen – Hintergrundbild vs. “Sky Dome” Kugel



## Hintergrund und Szenen – Detaillierter Raum

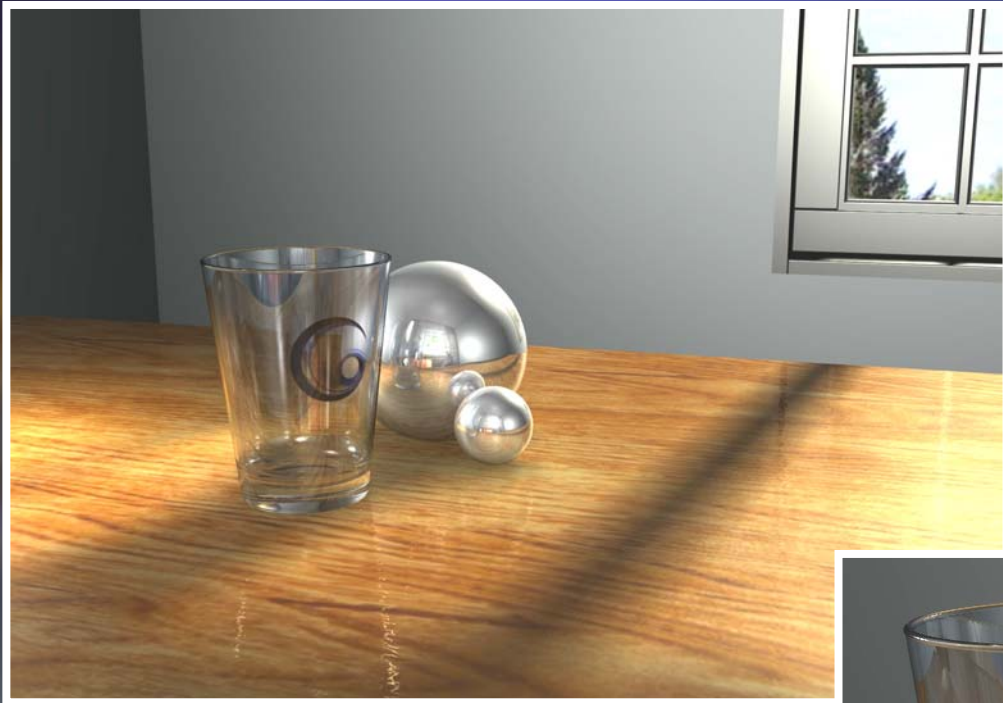


Erstellen Sie Ihre Welt!

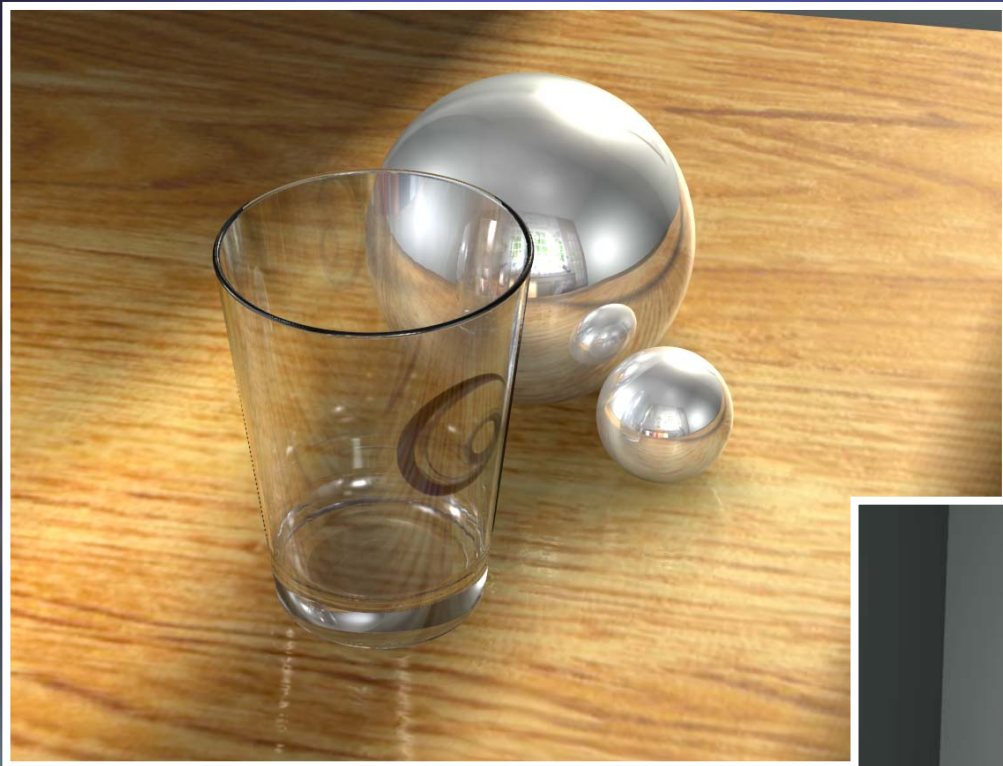
Betrachtung der Szene



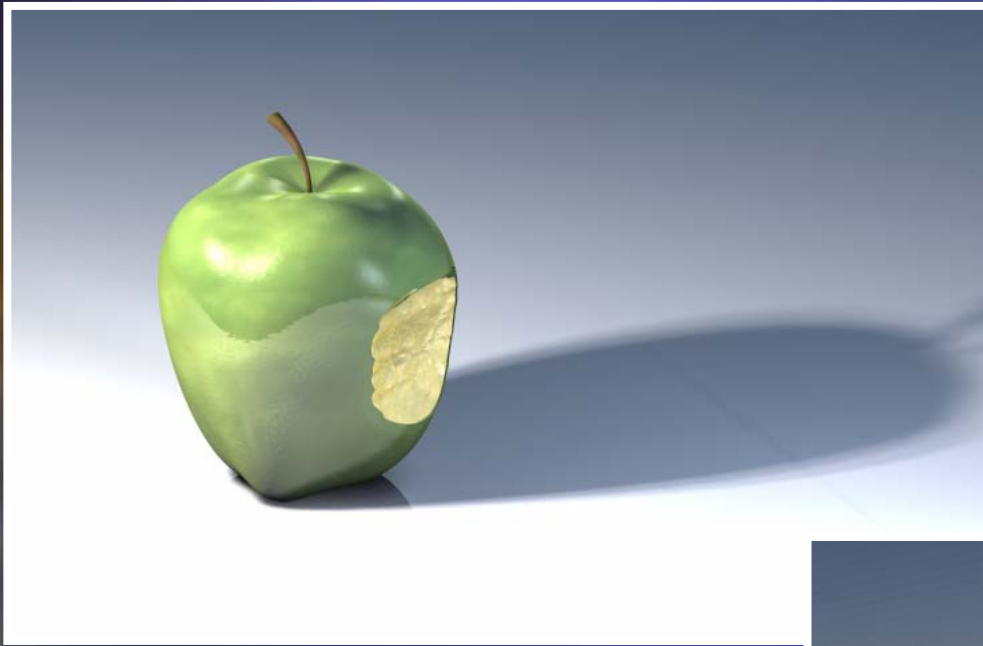
**Betrachtung der Szene:** Ansichtswinkel - Weitwinkel oder Grossaufnahme?



# Betrachtung der Szene: Weitwinkel- Grosser oder kleiner Winkel?



## Betrachtung der Szene: Entscheiden Sie von wo das Licht kommt

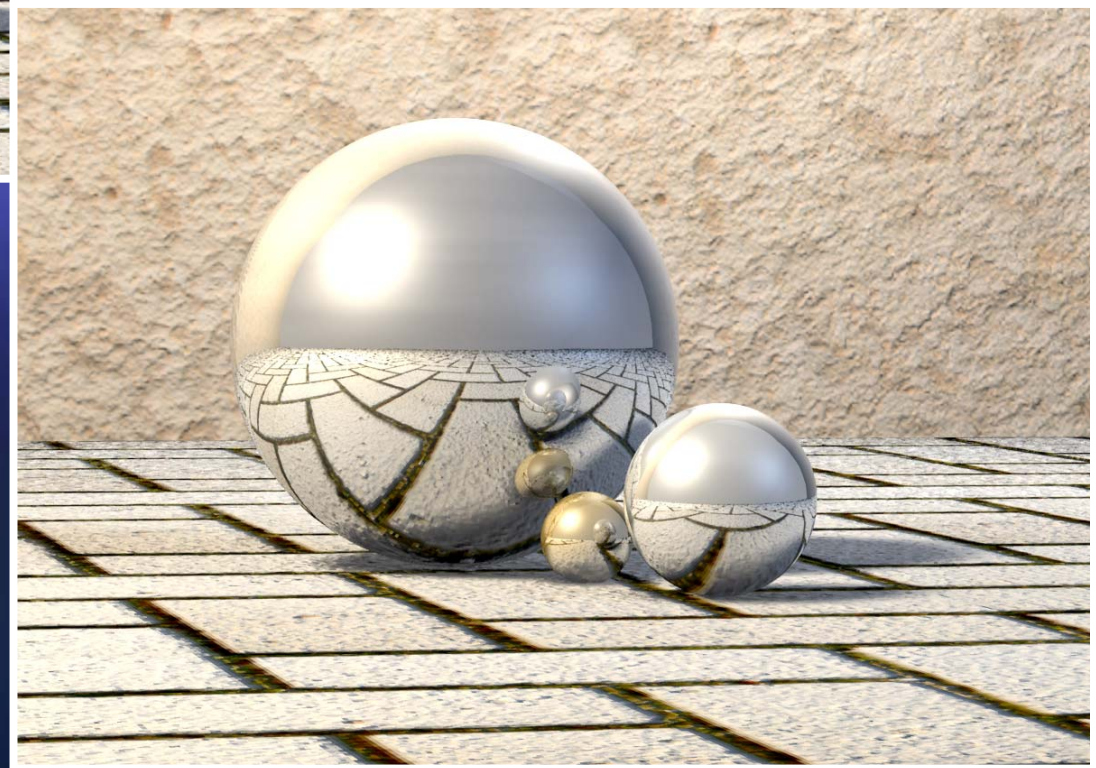
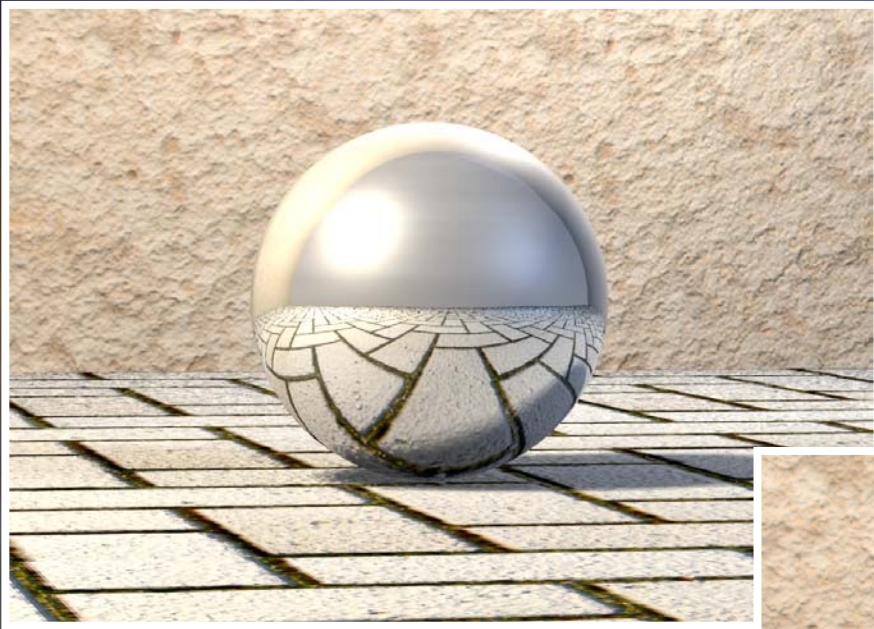


Welche Seite Ihres Objekt soll beleuchtet sein, bzw. welche Seite Ihres Objekts soll Schatten enthalten.



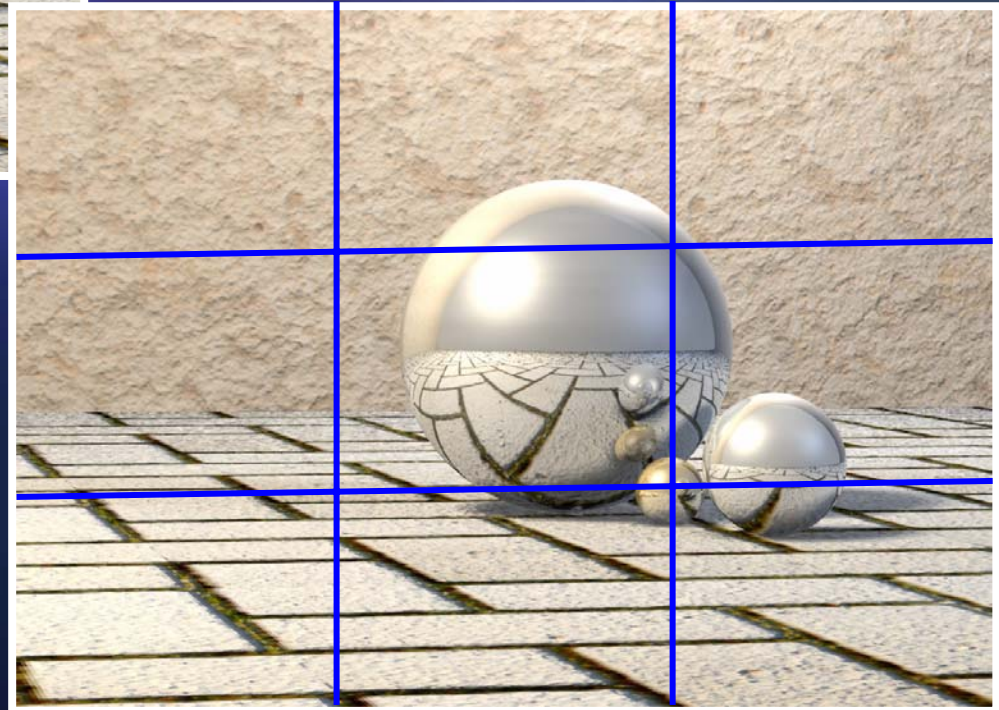


## Betrachtung der Szene: Was ist der Brennpunkt?

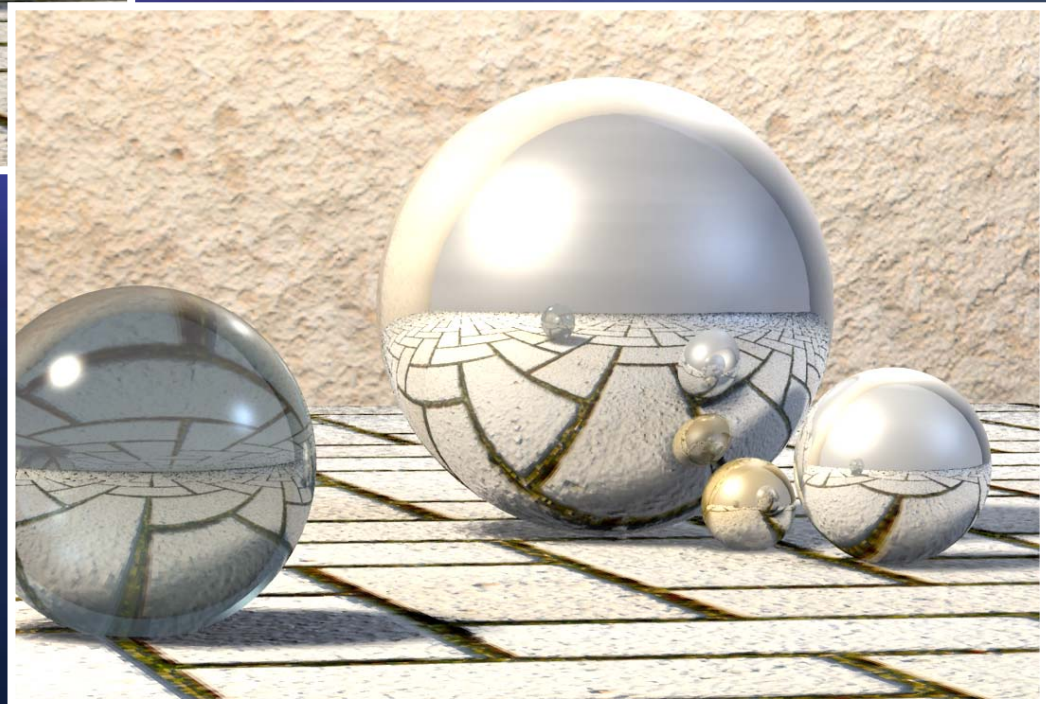
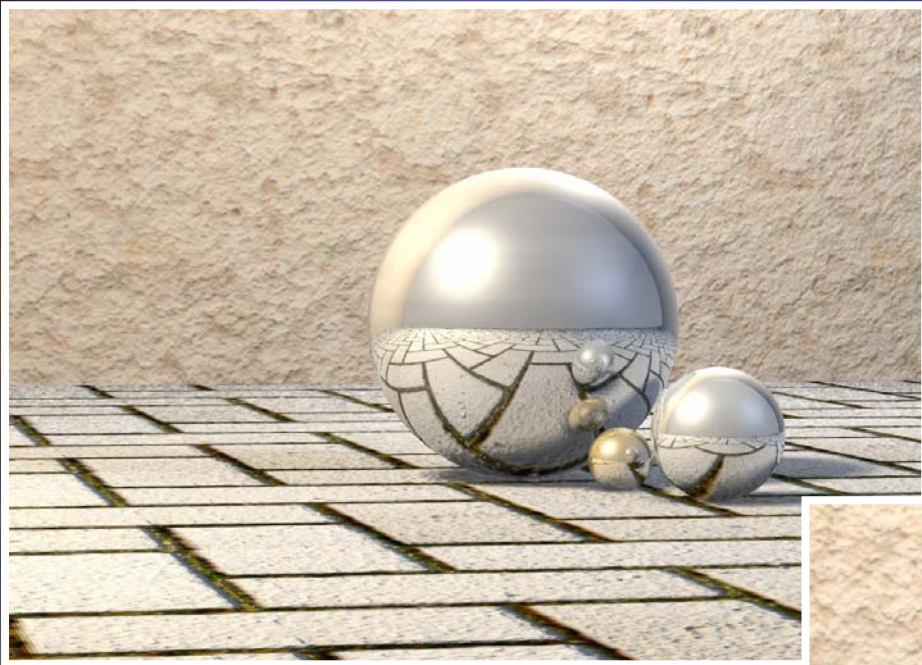




## Betrachtung der Szene: Die "Dreier Regel"



# Betrachtung der Szene: Ausgewogene Zusammenstellung

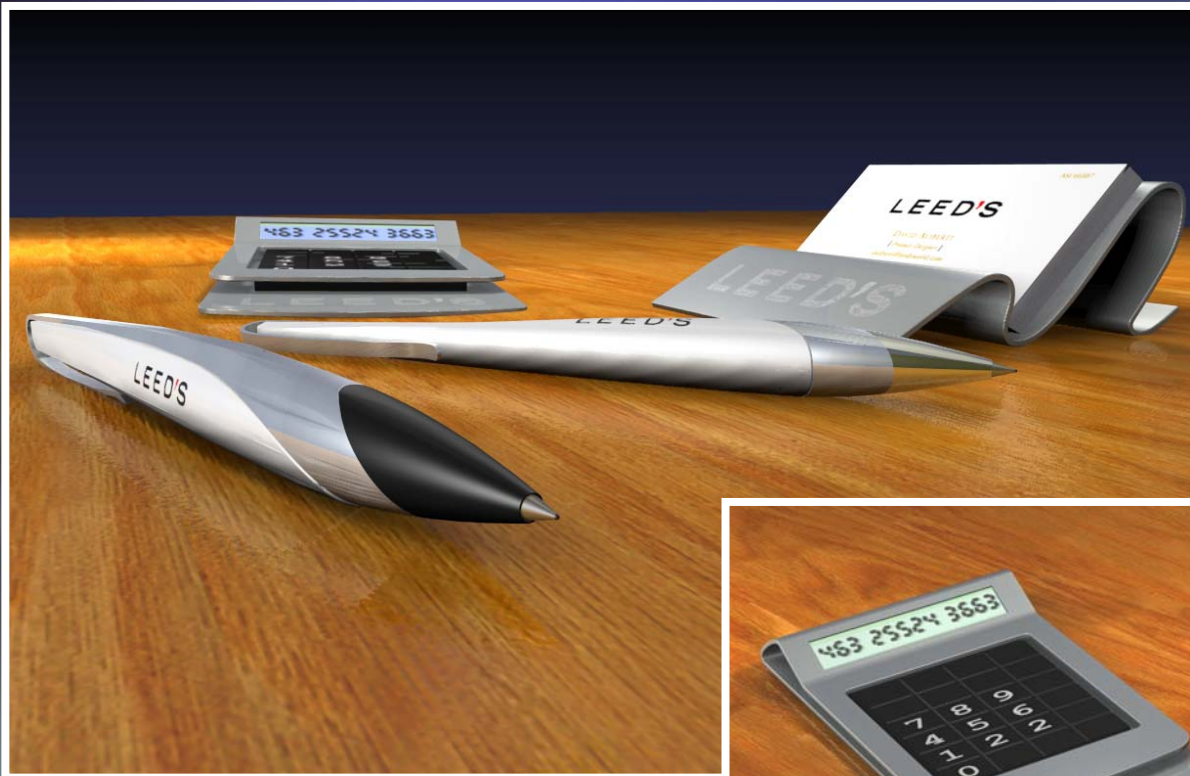




Erstellen Sie Ihre Welt!

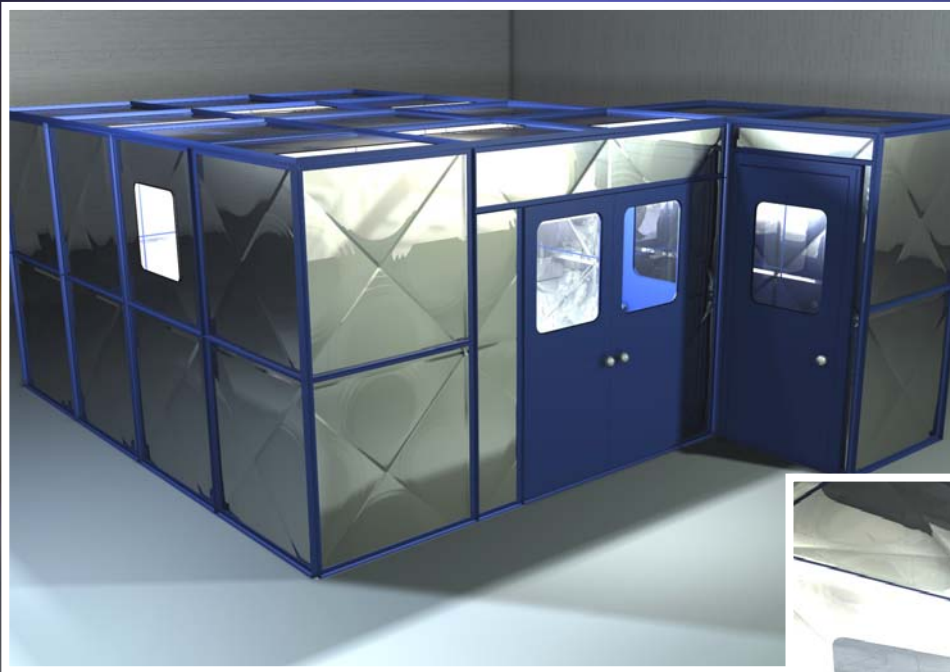
Perspektive

## Perspective: Ansicht unten oben?



## Perspektive: Ansichtst Innen oder Aussen?

Objekt Grösse = 240'' x 190''



← Ansicht aussen:

FOV = 40

Focal Length = 400

Ansicht innen: →

FOV = 65

Focal Length = 120





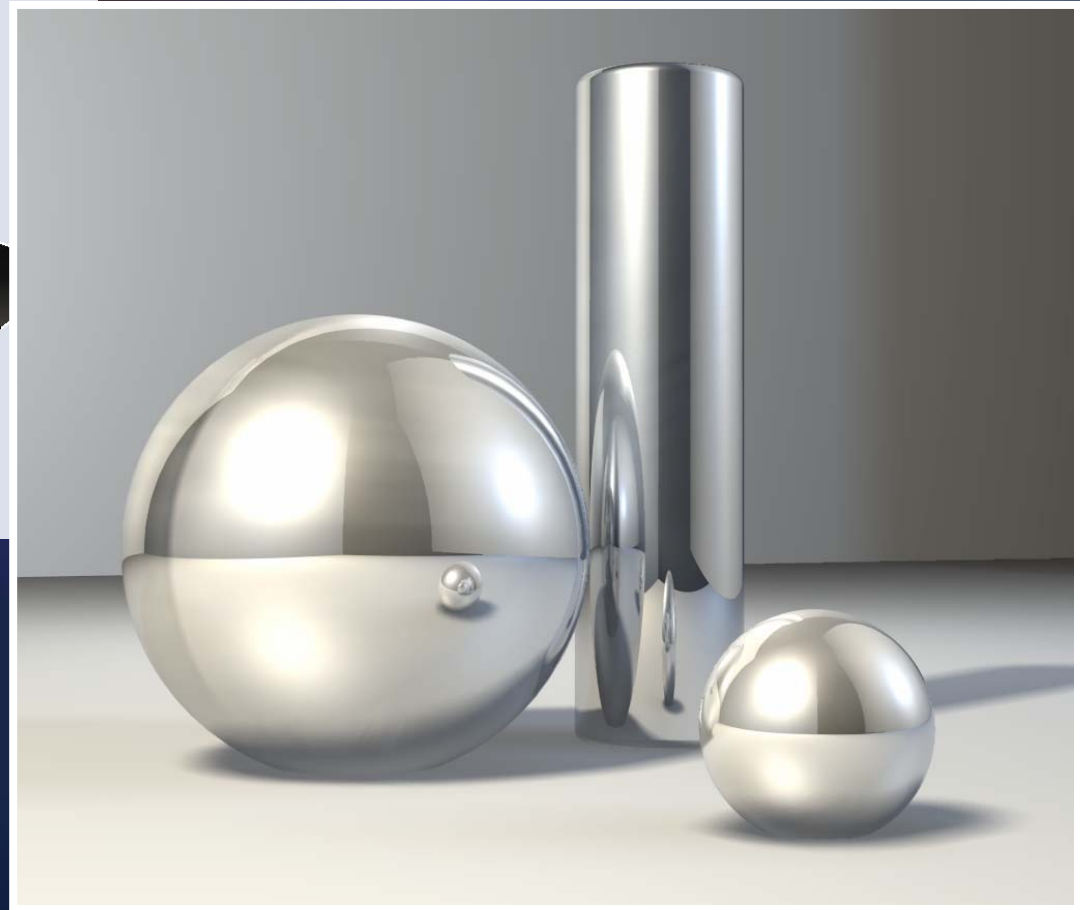
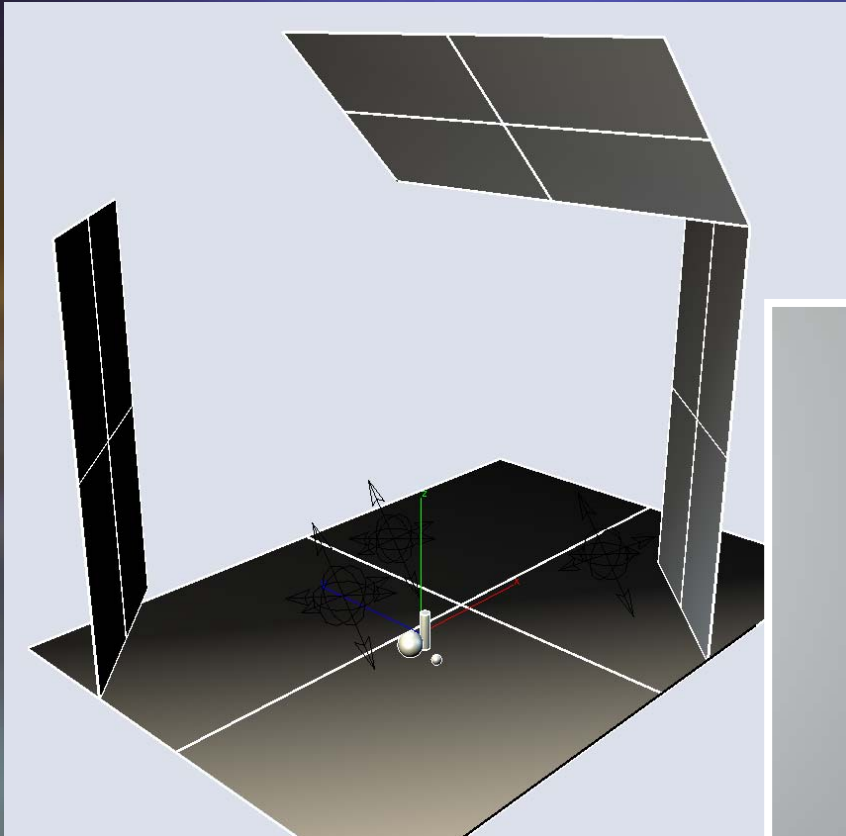
Erstellen Sie Ihre Welt!

# Reflektierende Objekte

## Reflektierende Objekte: Boden und weitere Objekte

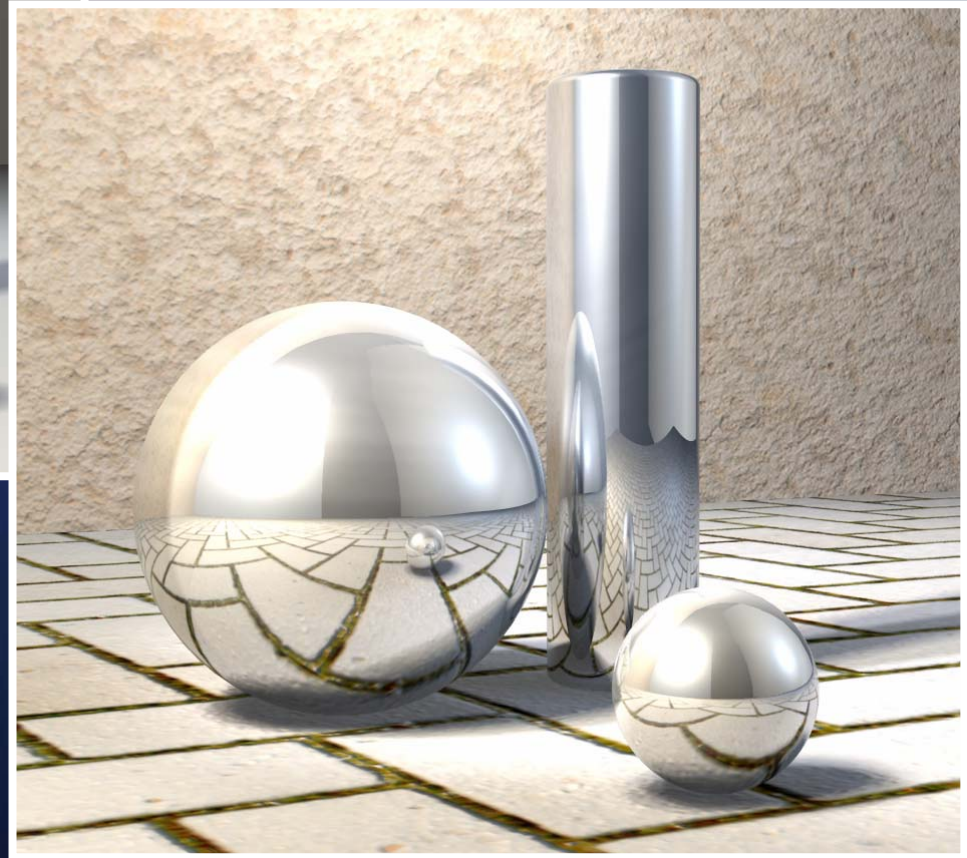
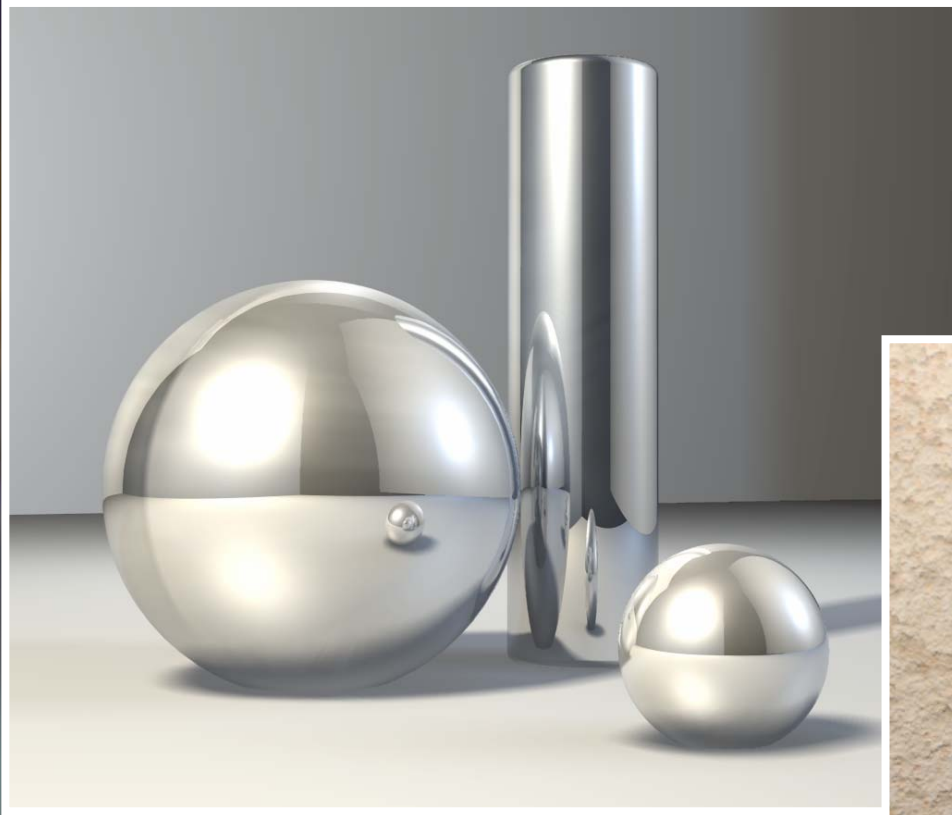


# Reflektierende Objekte : Ausserhalb des Bildes liegende Objekte





## Reflektierende Objekte: Texturen

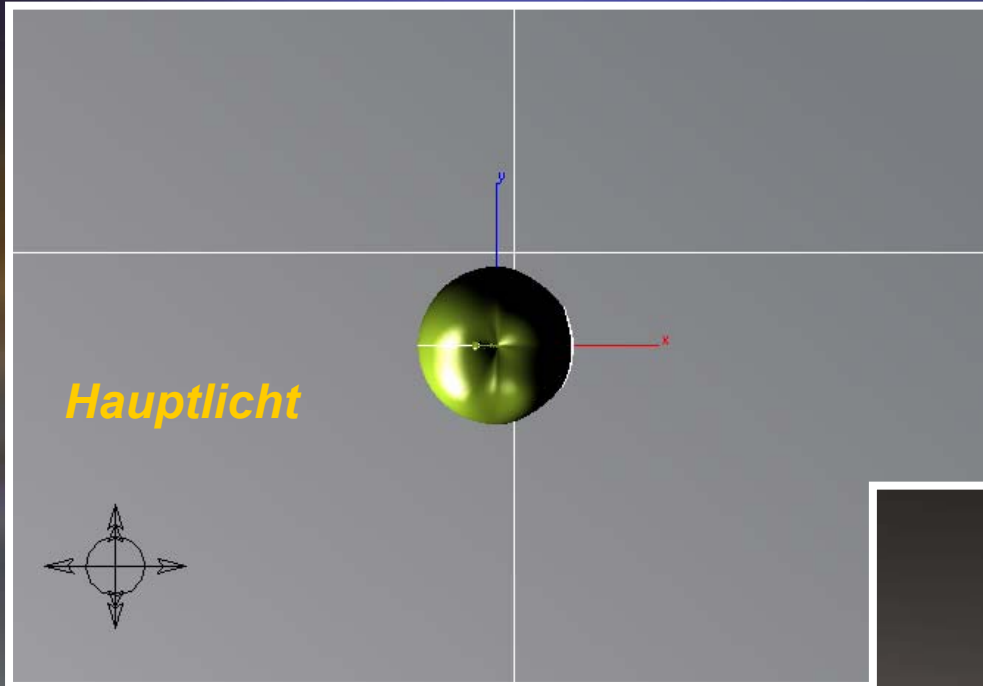


Beleuchten Sie Ihre Welt!

Lichtquellen einrichten –

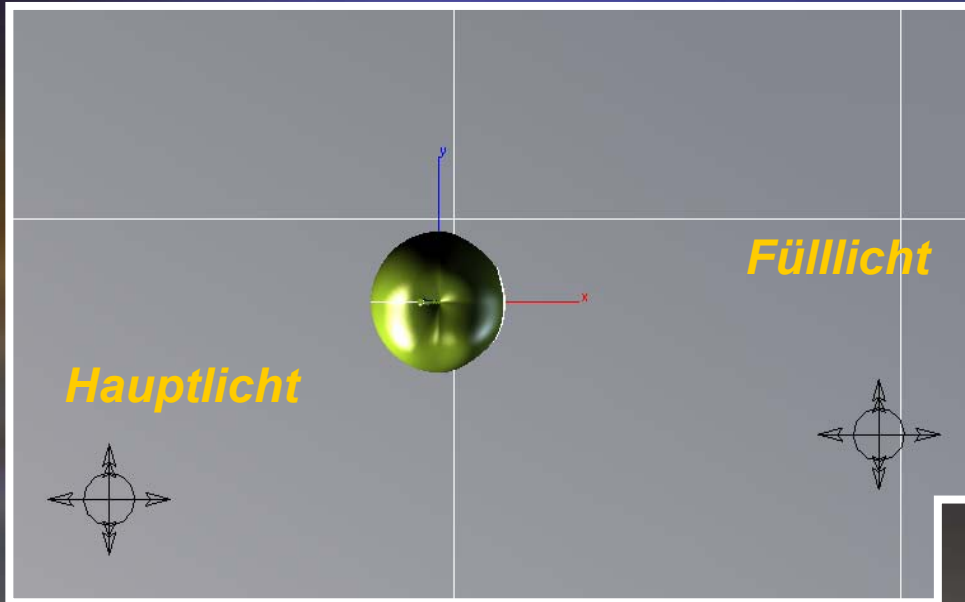
Danken Sie wie ein Fotograf

## 3 Punkt Lichtquelle einrichten: Das Hauptlicht

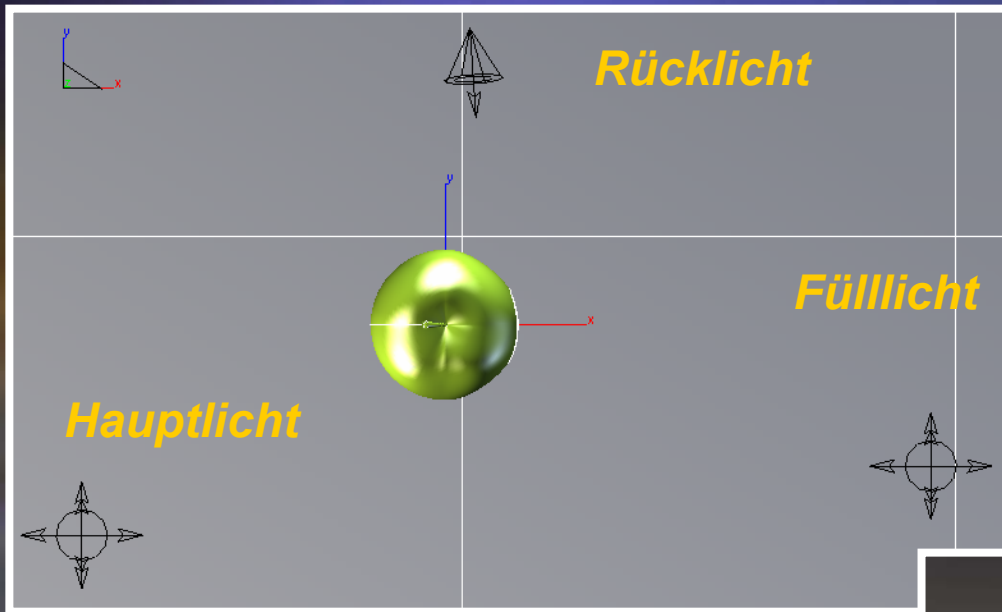




## 3 Punkt Lichtquelle einrichten : Das Fülllicht



## 3 Punkt Lichtquelle einrichten : Das Rücklicht

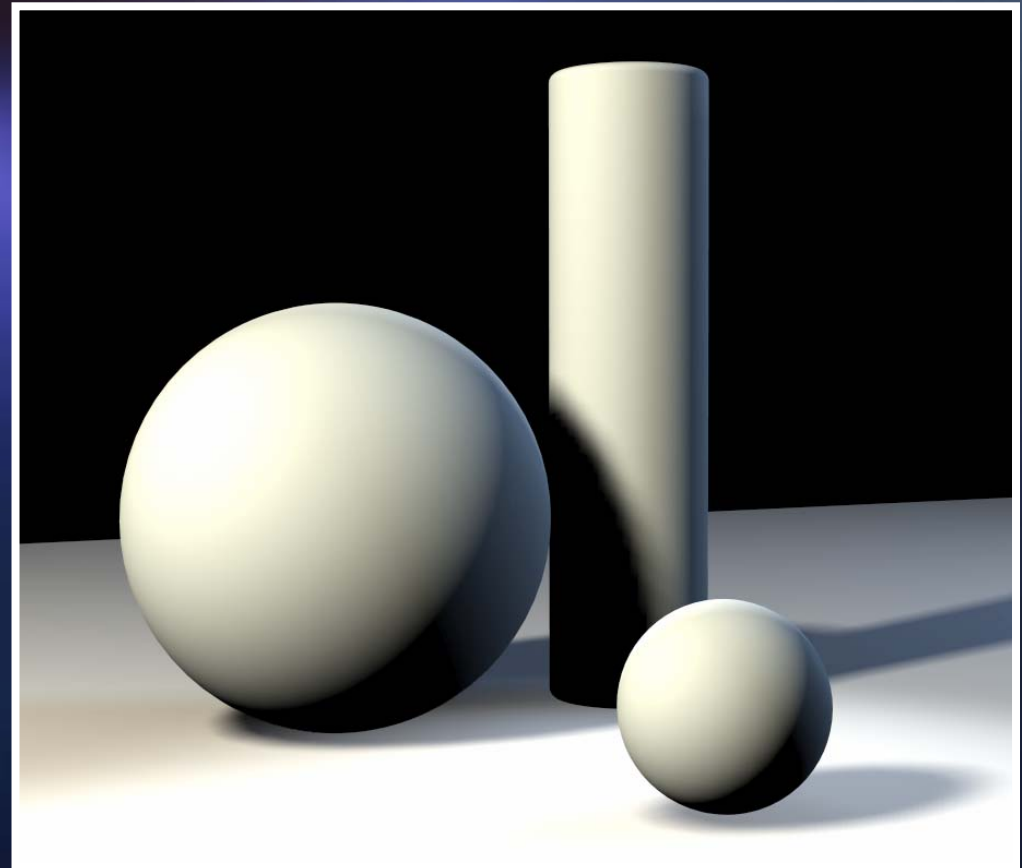
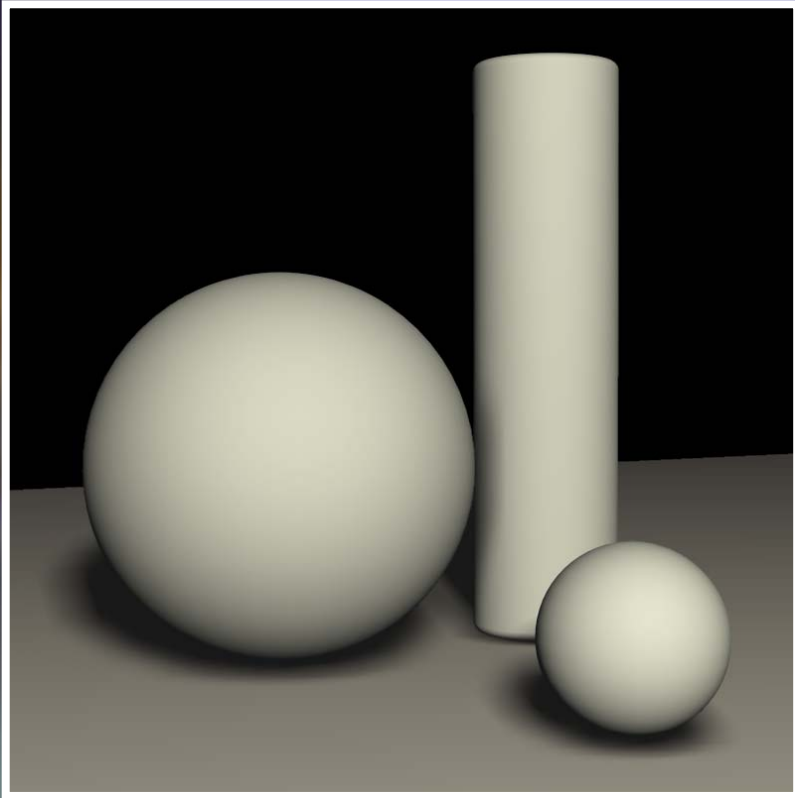


Beleuchten Sie Ihre Welt!

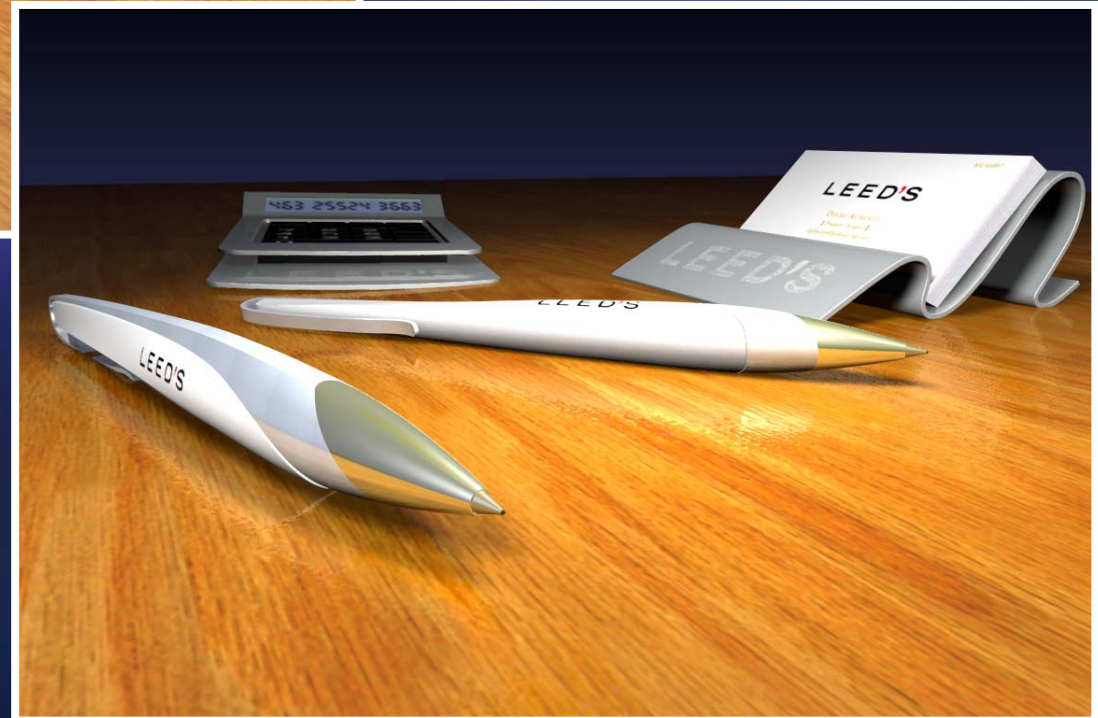
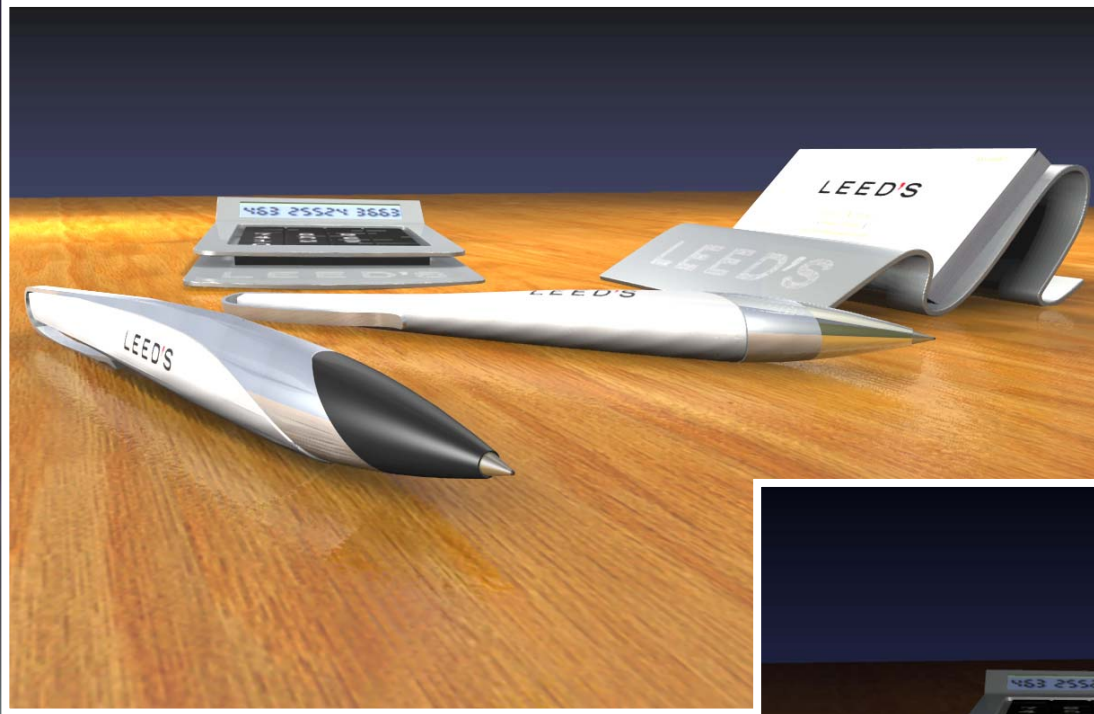
# Anordnung und Beleuchtung



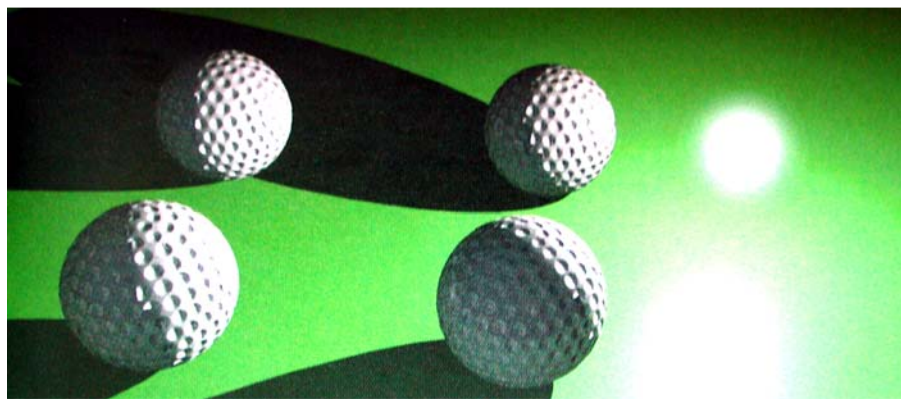
## Licht gibt Form und Tiefe



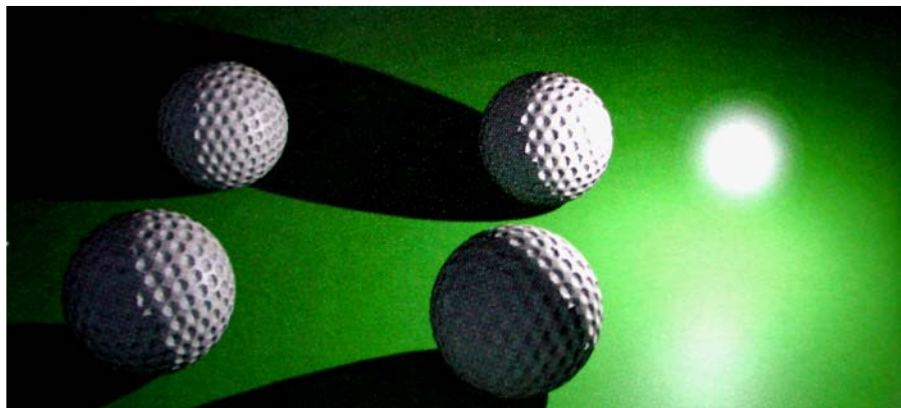
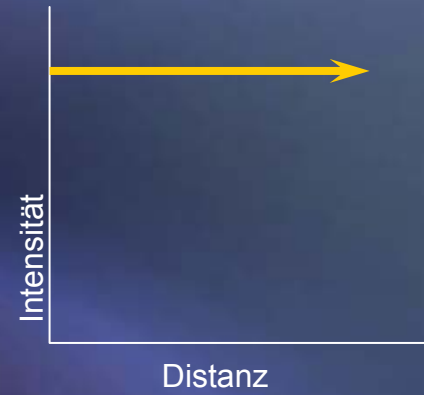
# Licht weckt Interesse



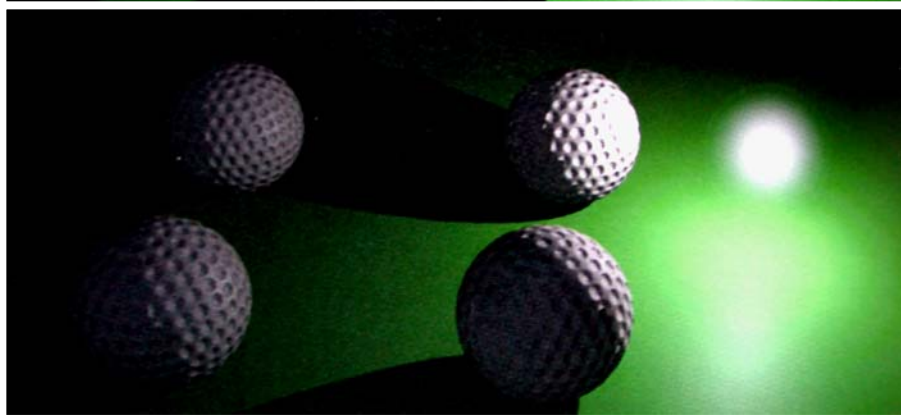
# Echtes Licht verliert an Intensität durch Distanz



GLEICH



LINEAR



QUADRATISCH

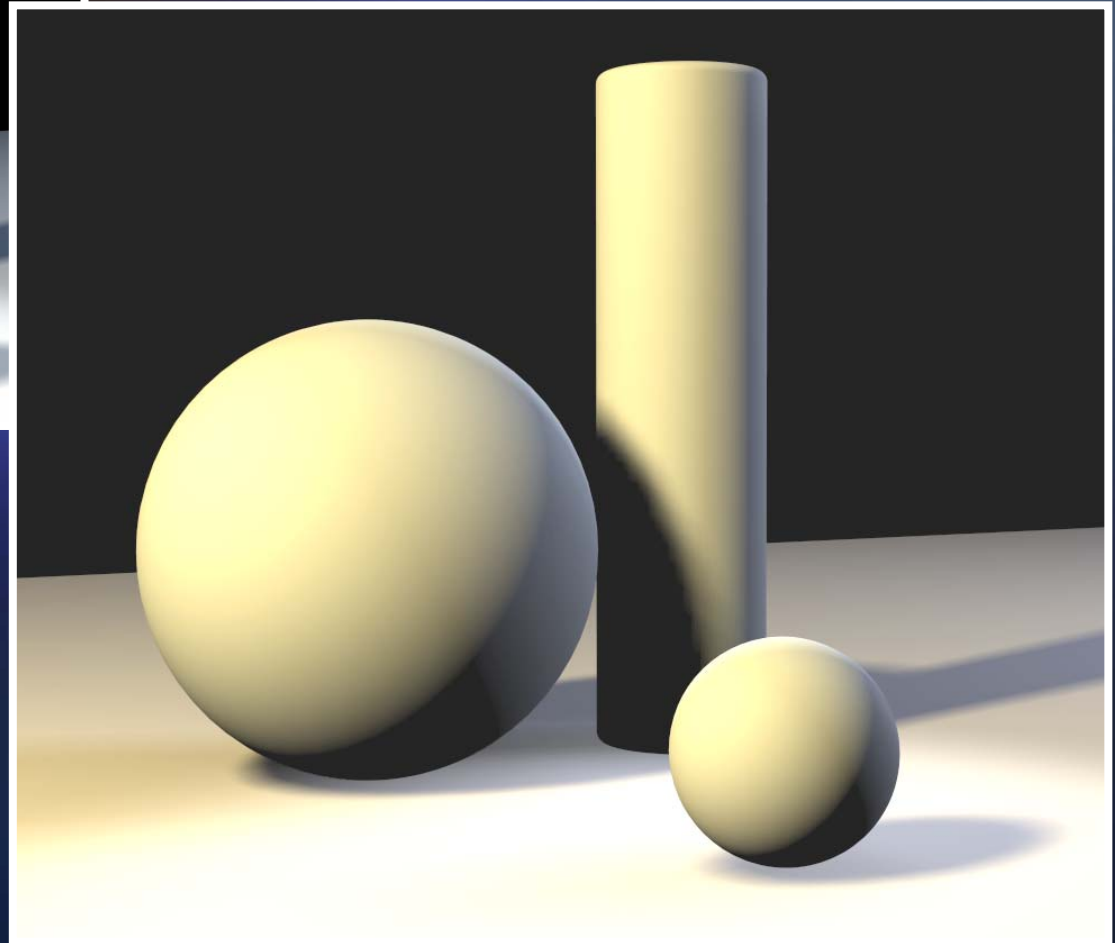
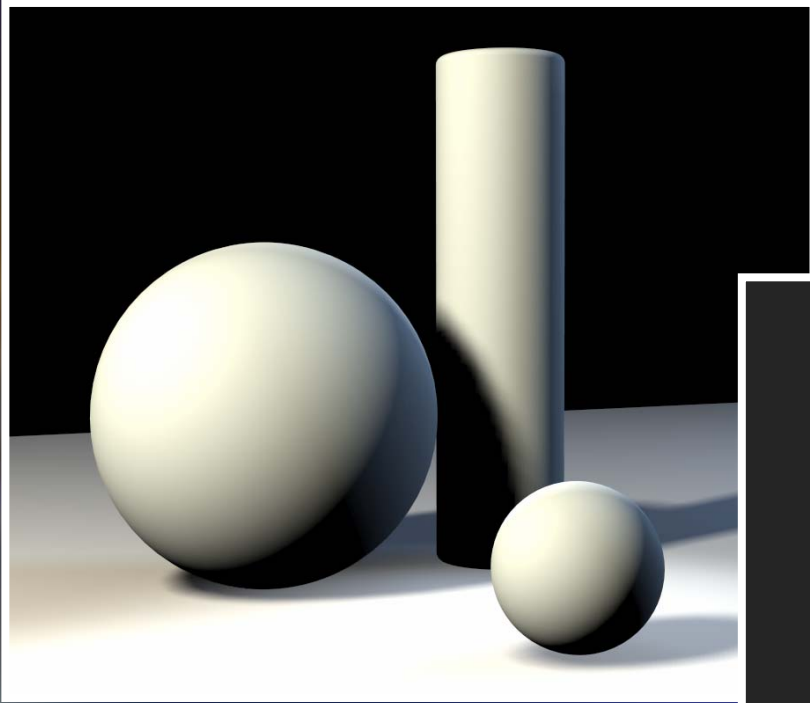




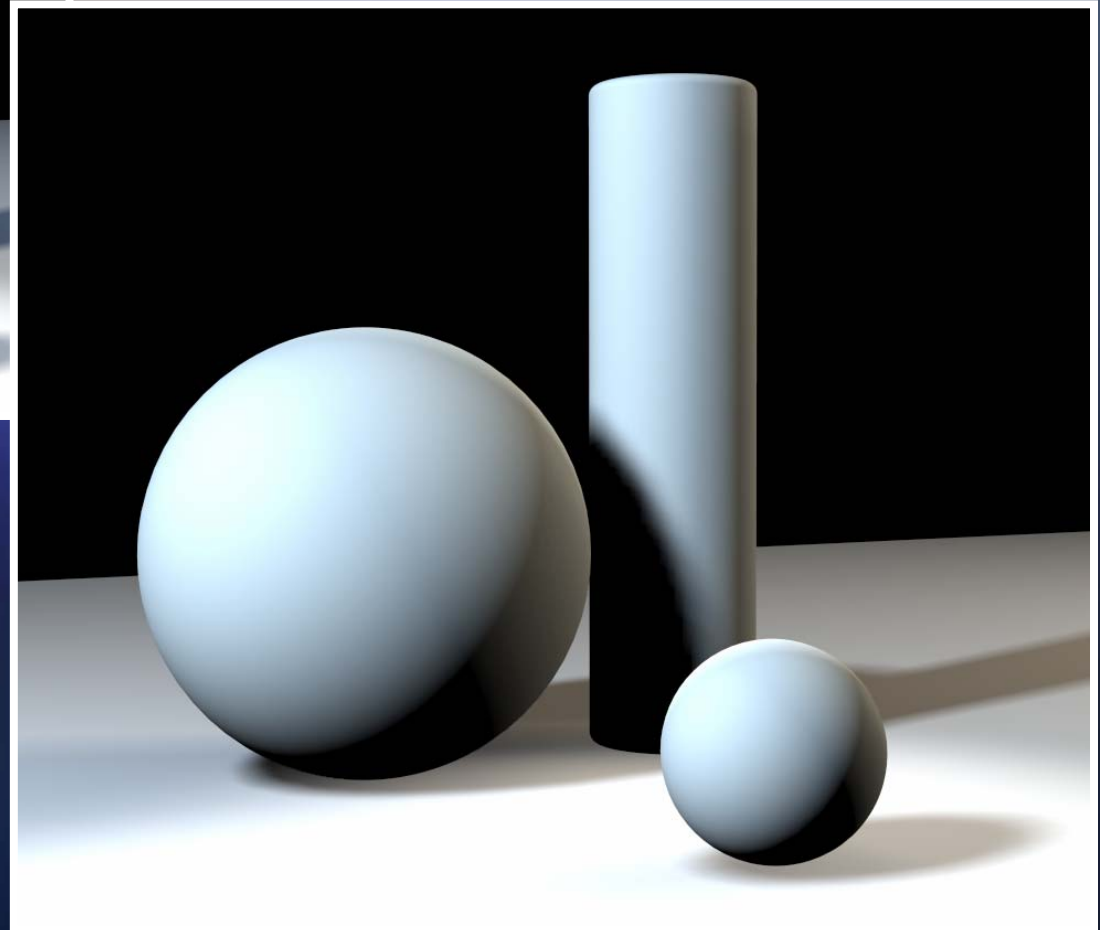
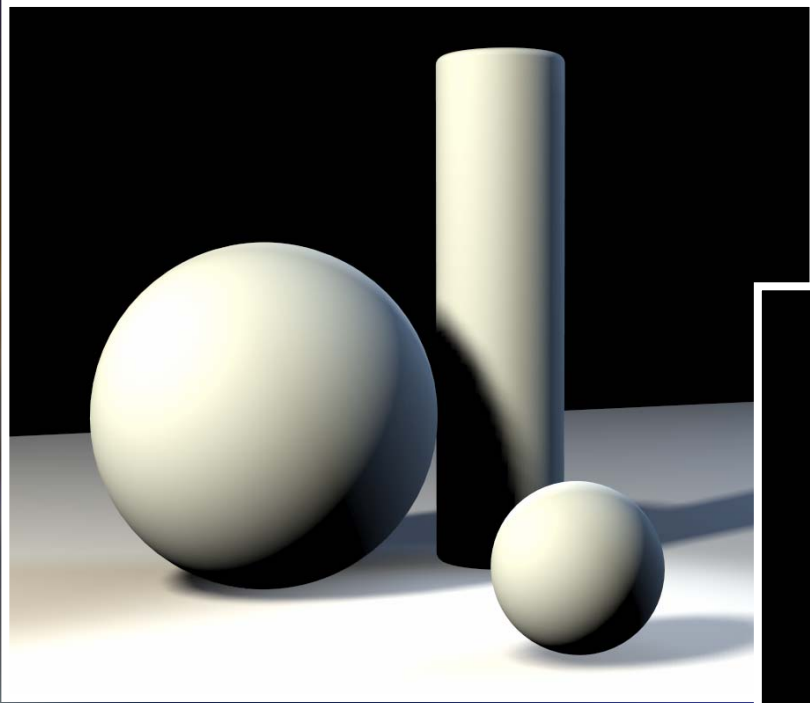
Beleuchten Sie Ihre Welt!

Licht, Farbe, Stimmung

## Licht und Farbe ergibt Stimmung



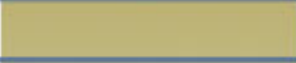

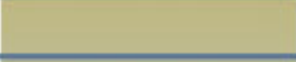
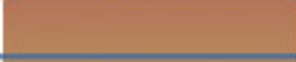
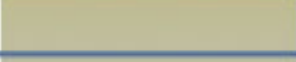
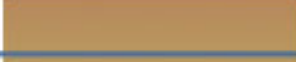
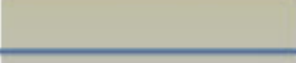
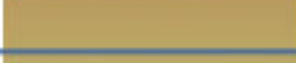

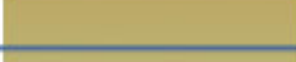
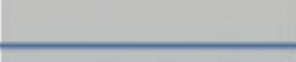
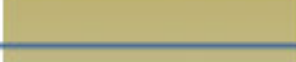

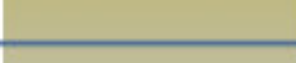
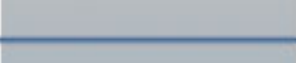
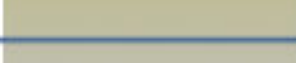

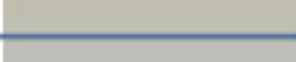


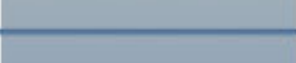
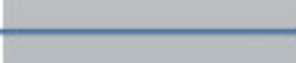





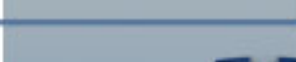




## Licht und Farbe ergibt Stimmung





## Licht und Farbe ergibt Stimmung

Degrees Kelvin	Type of Light Source	Indoor (3200k) Color Balance	Outdoor (5500k) Color Balance
1700-1800K	Match Flame		
1850-1930K	Candle Flame		
2000-3000K	Sun: At Sunrise or Sunset		
2500-2900K	Household Tungsten Bulbs		
3000K	Tungsten lamp 500W-1k		
3200-3500K	Quartz Lights		
3200-7500K	Fluorescent Lights		
3275K	Tungsten Lamp 2k		
3380K	Tungsten Lamp 5k, 10k		
5000-5400K	Sun: Direct at Noon		
5500-6500K	Daylight (Sun + Sky)		
5500-6500K	Sun: through clouds/haze		
6000-7500K	Sky: Overcast		
6500K	RGB Monitor (White Pt.)		
7000-8000K	Outdoor Shade Areas		
8000-10000K	Sky: Partly Cloudy		

Based on information from the book [digital] Lighting & Rendering

Chart and colors (c)2001 Jeremy Birn for [3DU.com](http://3DU.com)



## Licht und Farbe ergibt Stimmung

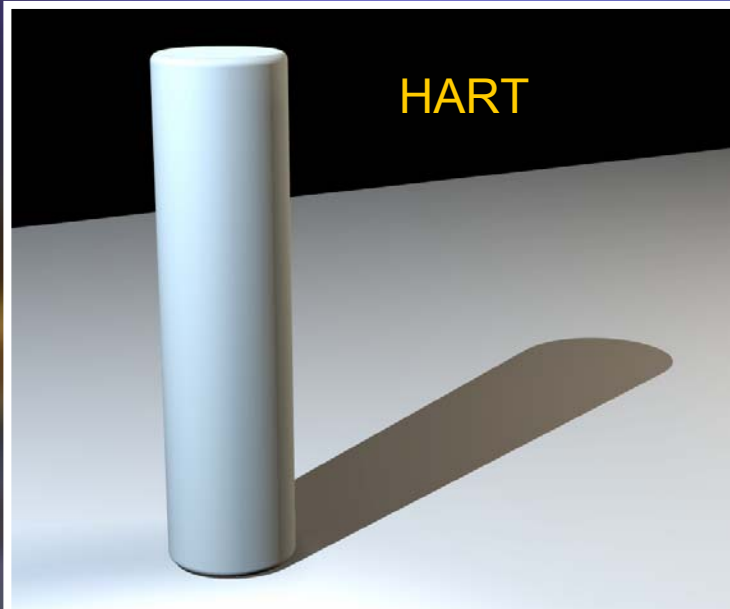


Beleuchten Sie Ihre Welt!

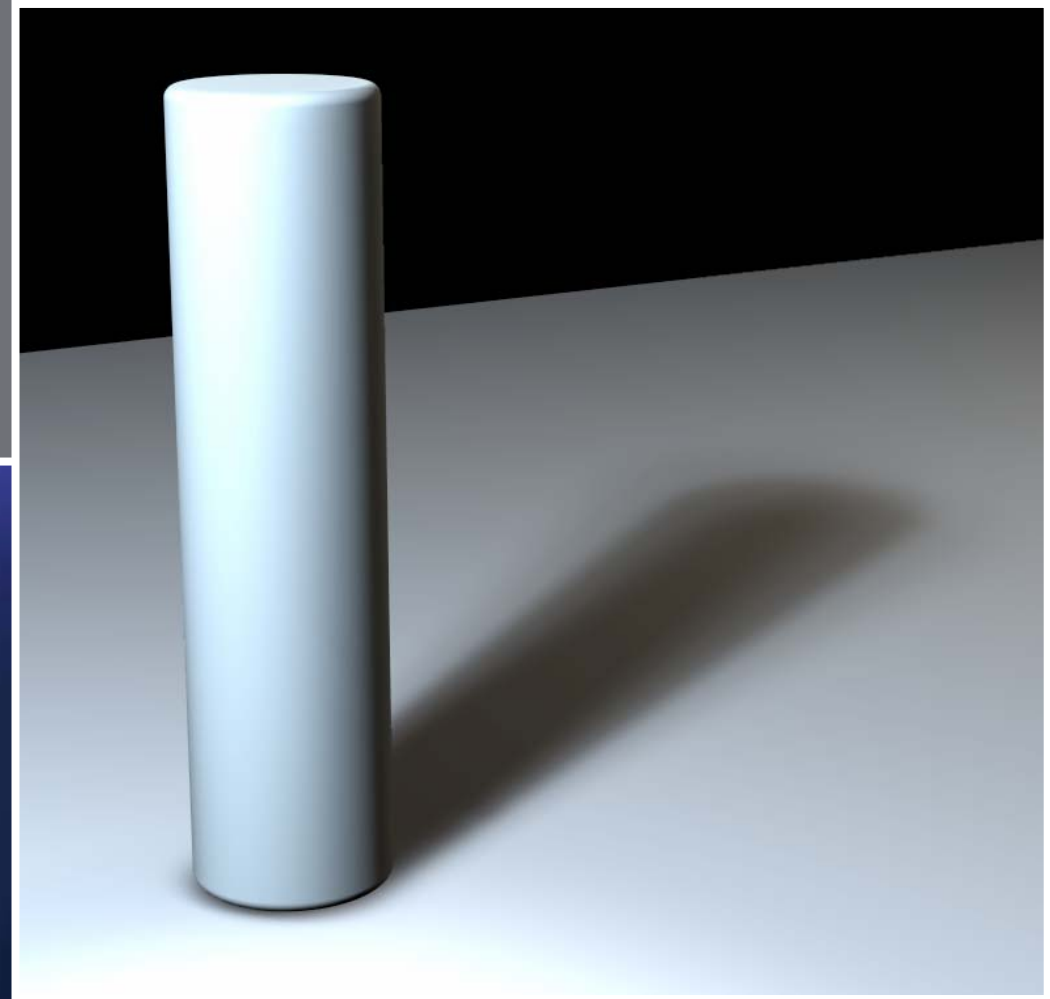
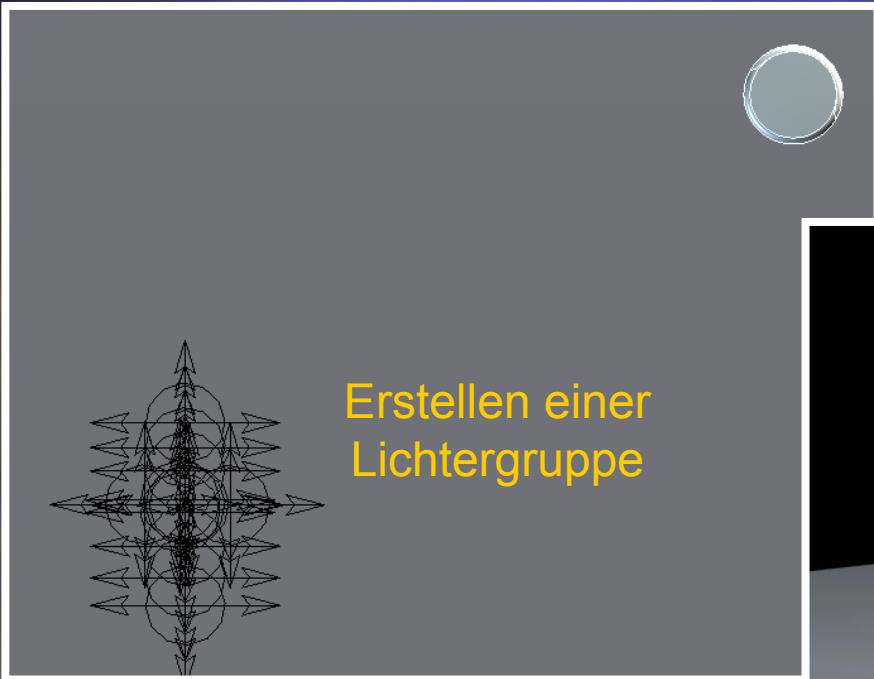
Schatten



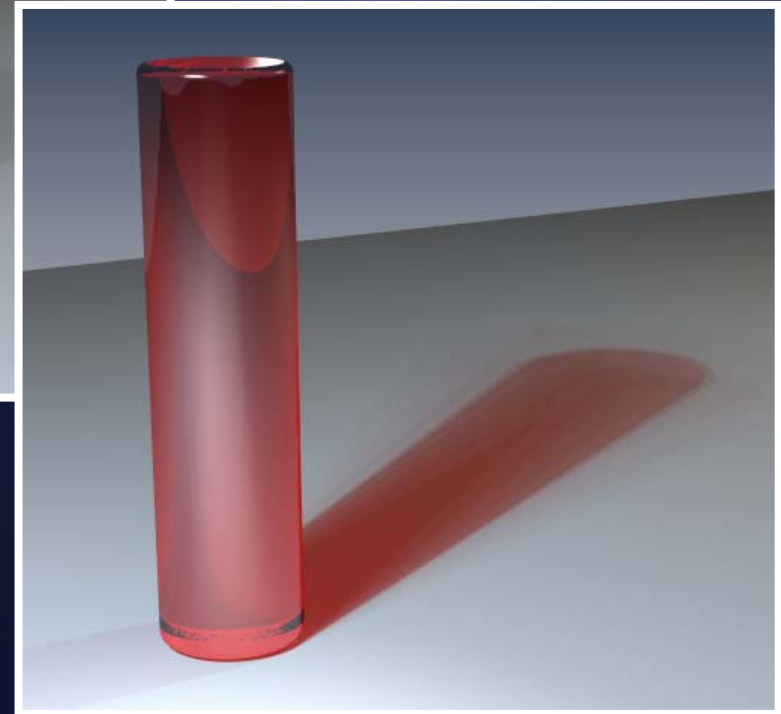
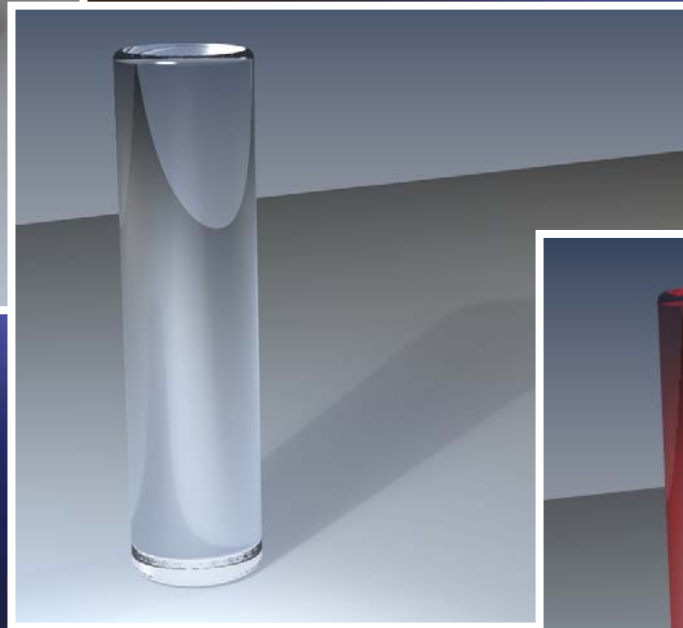
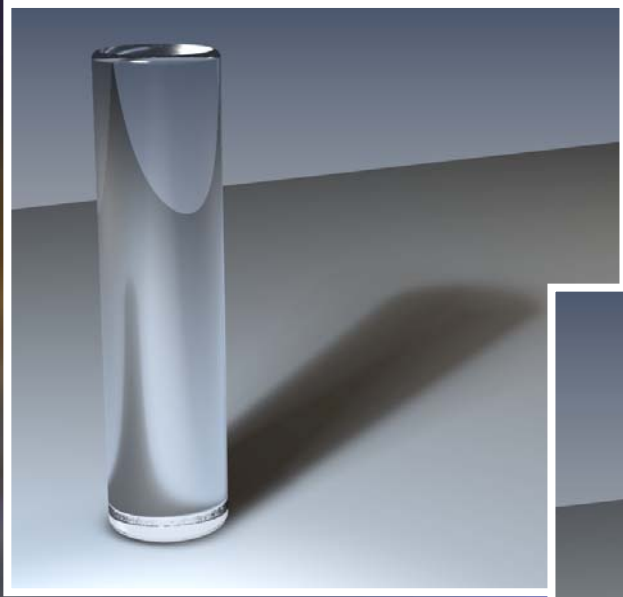
# Schatten - Hart oder Weich ?



# Schatten – Simulation von Umgebungslicht

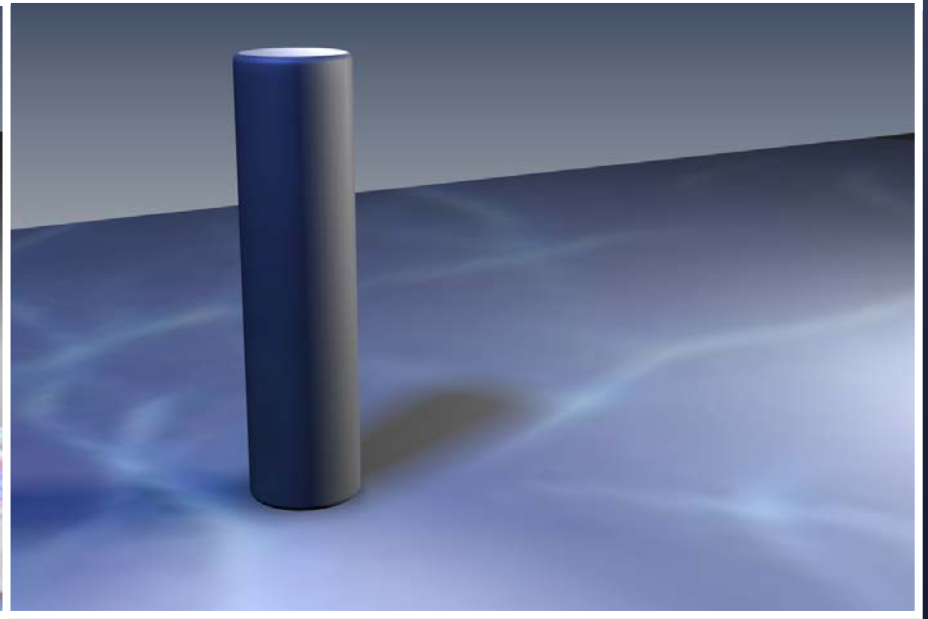
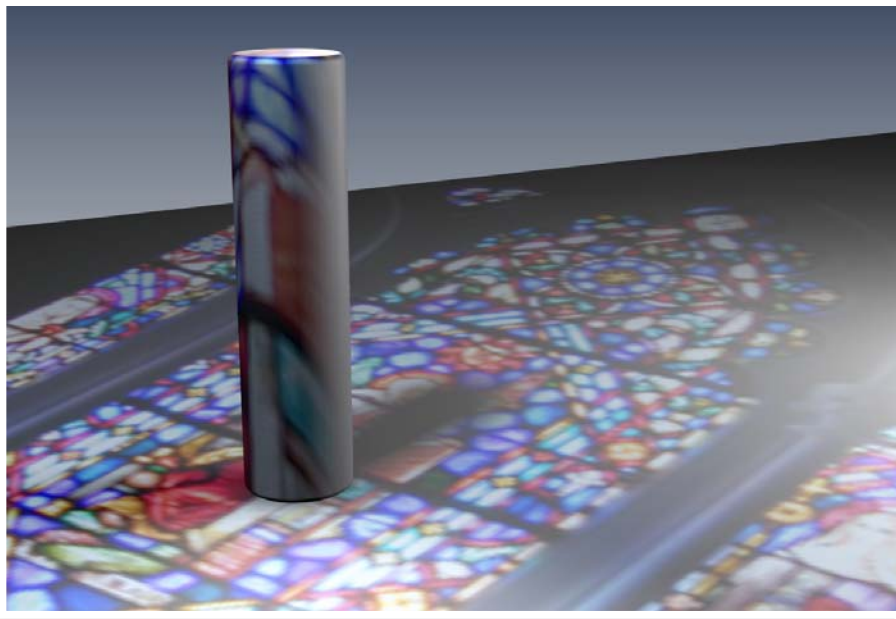
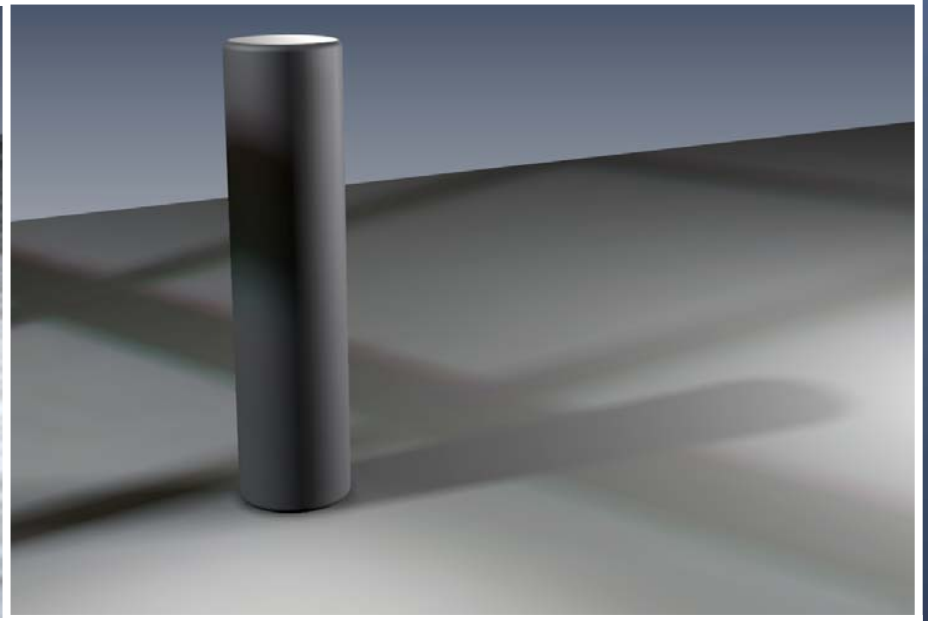
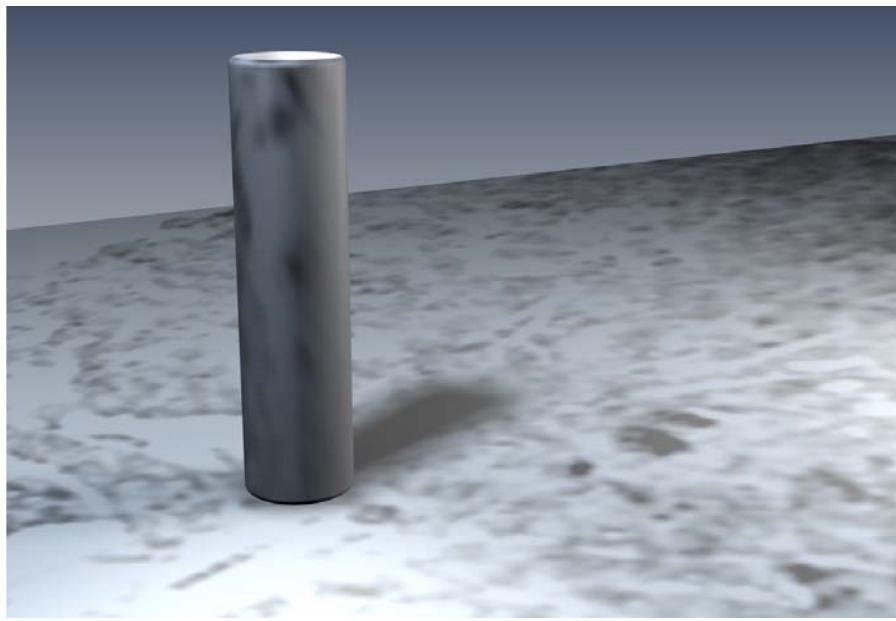


## Schatten - Transparente Schatten





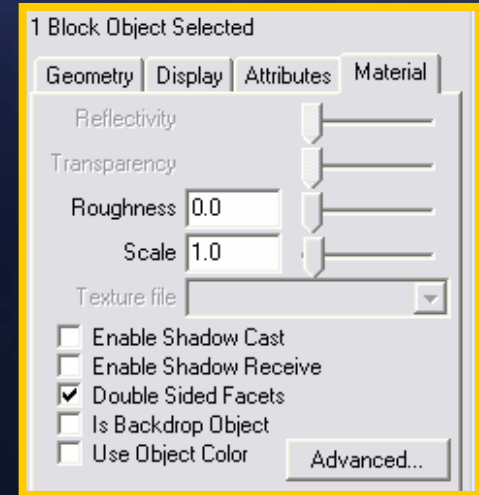
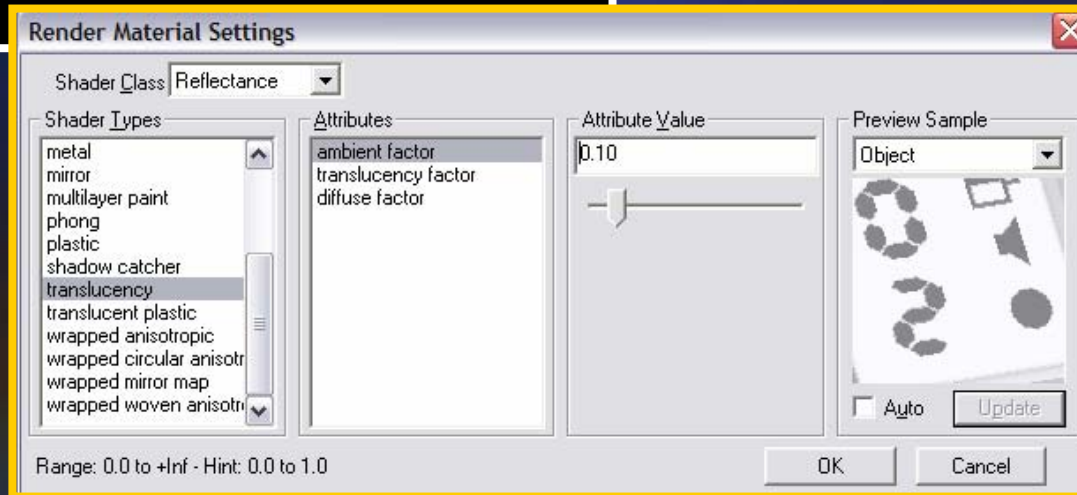
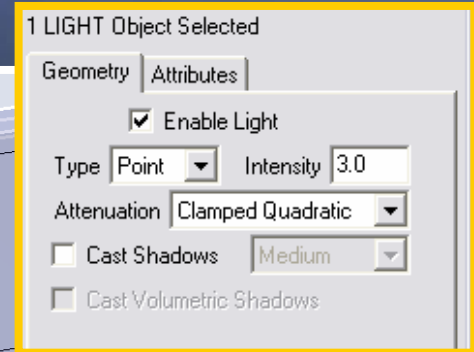
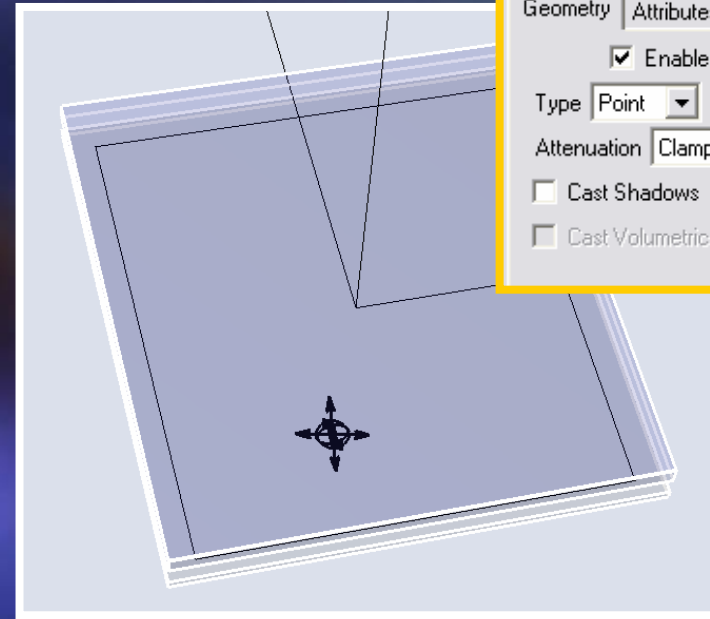
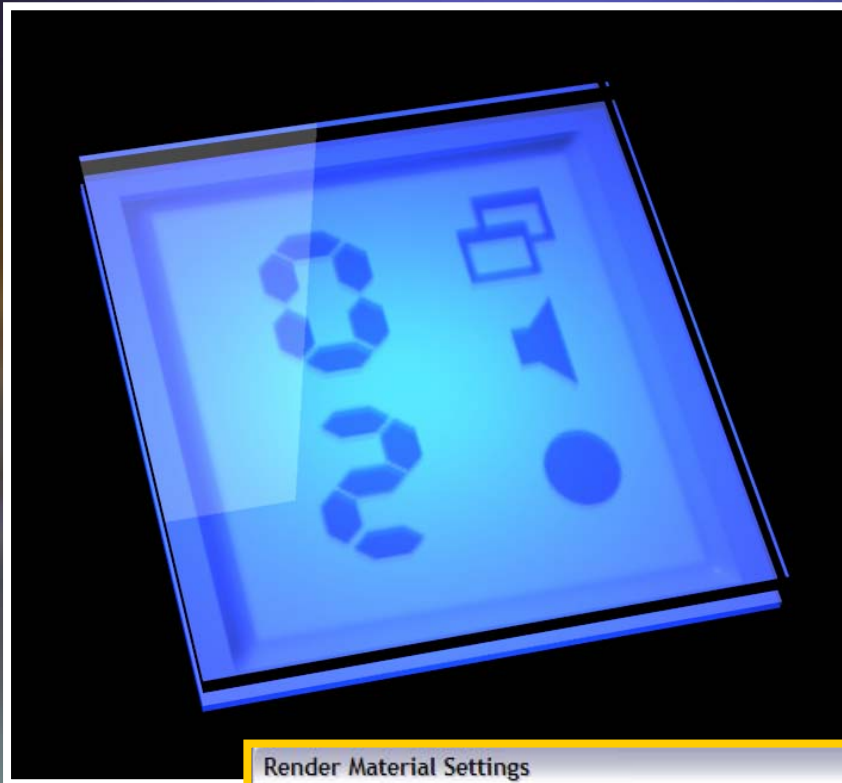
# Schatten – Erstellen von Schatten mit “Gel” Images



Beleuchten Sie Ihre Welt!

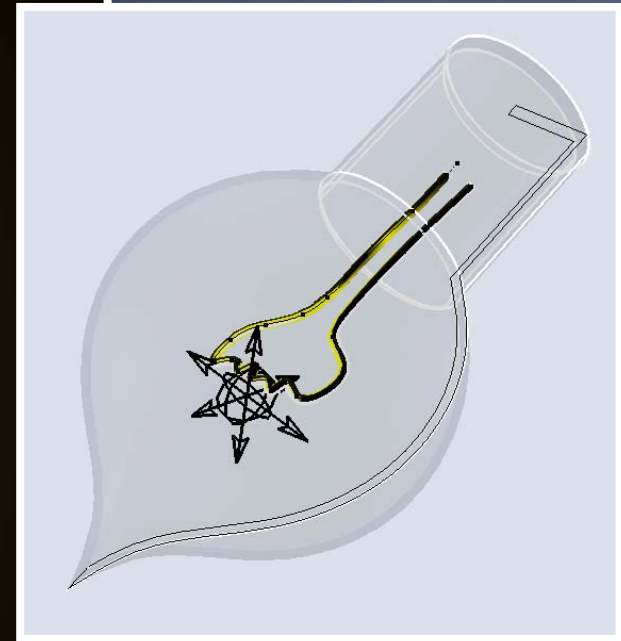
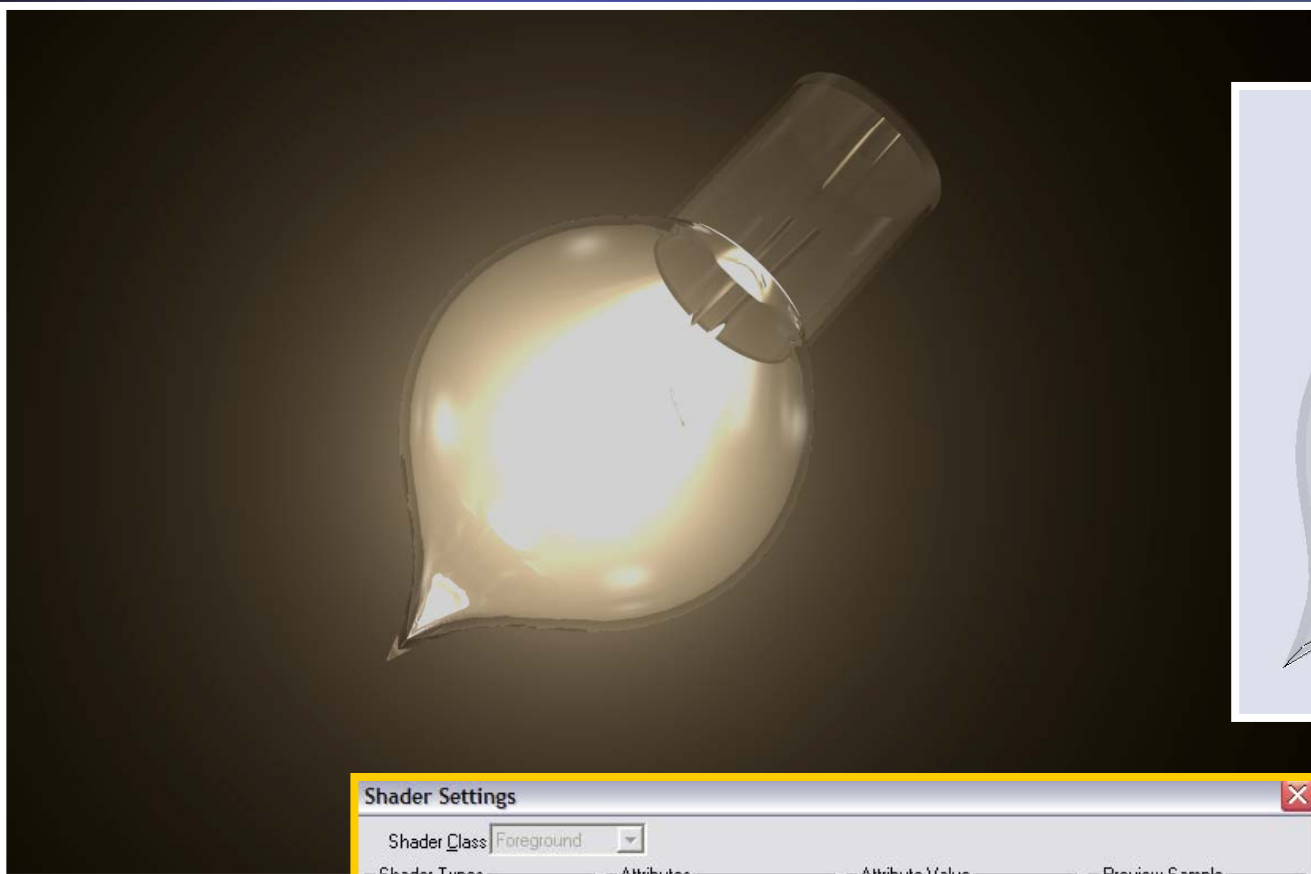
Leuchtende Objekte

# Leuchtende Objekte – Ein digitales Display





# Leuchtende Objekte – Eine Lampenbirne



**Shader Settings**

Shader Class: **Foreground**

Shader Types	Attributes	Attribute Value	Preview Sample
depth cue	fog density	0.0010	Cone
fog			
fog light			
ground fog			
none			
scattering medium			
snow			

Range: 0.0 to +Inf - Hint: 0.0 to 100.0

OK Cancel

**Edit Object**

1 LIGHT Object Selected

Geometry | Attributes

Enable Light

Type: **Point** Intensity: **300.0**

Attenuation: **Clamped Quadratic**

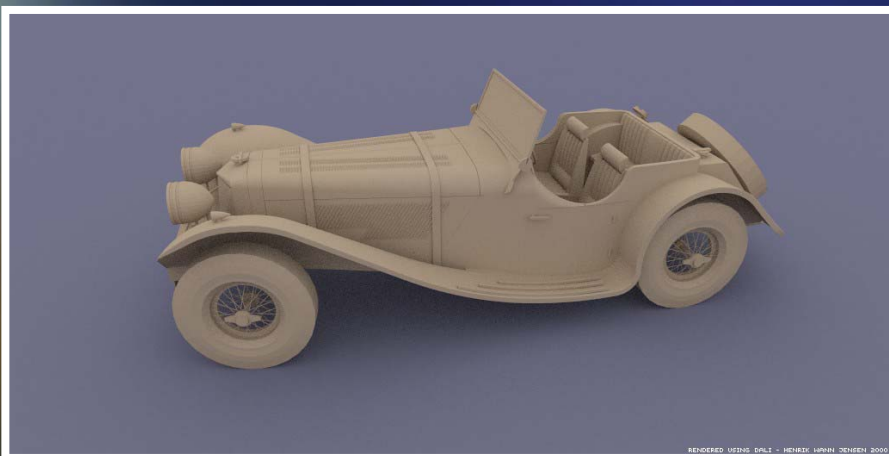
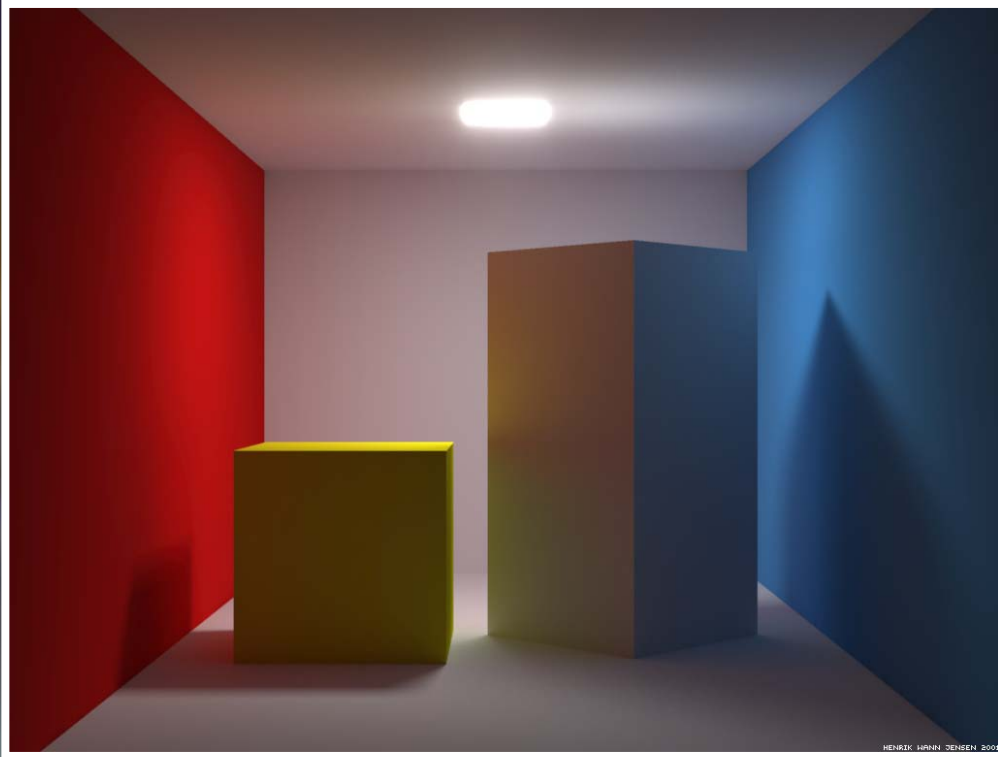
Cast Shadows **Blurry**

Cast Volumetric Shadows

Beleuchten Sie Ihre Welt!

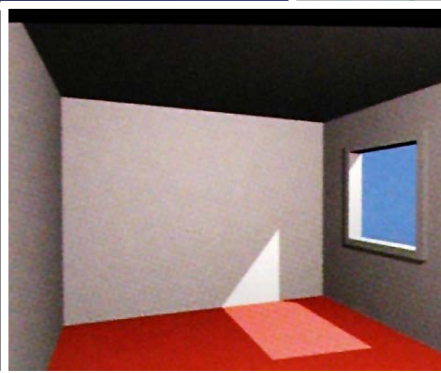
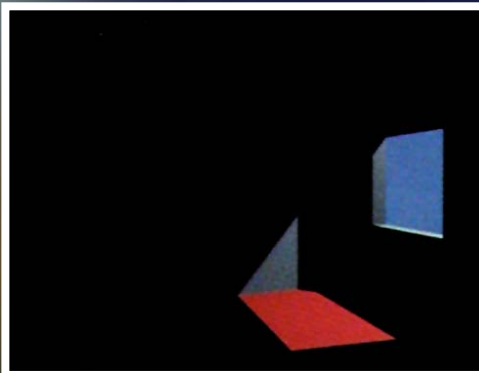
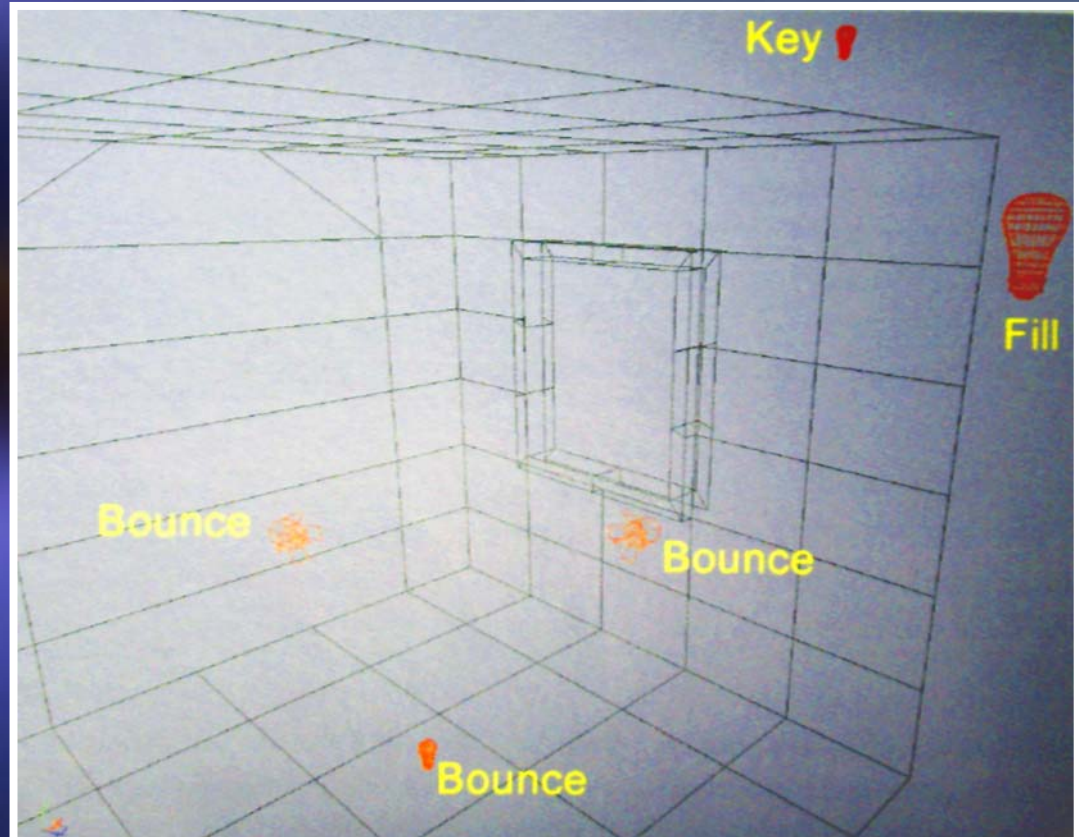
# Fortgeschrittene Beleuchtung

# Fortgeschrittene Beleuchtung: Was ist Indirekte Illumination

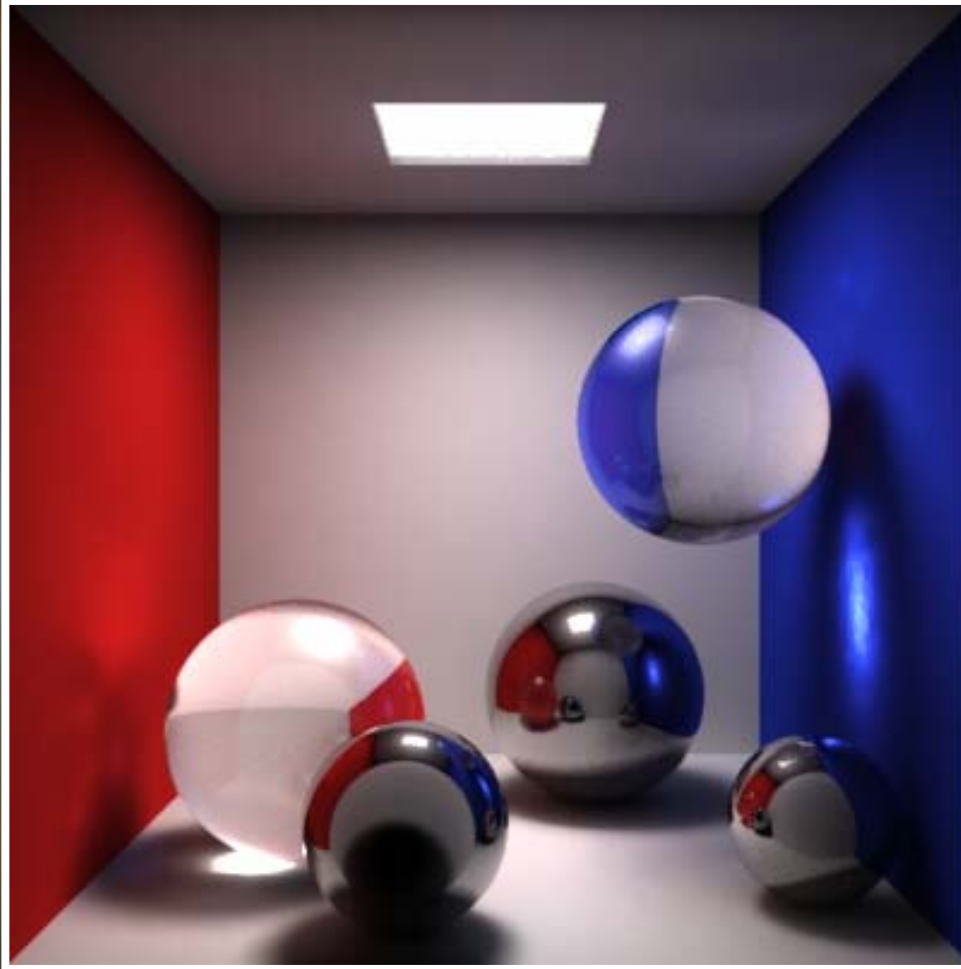
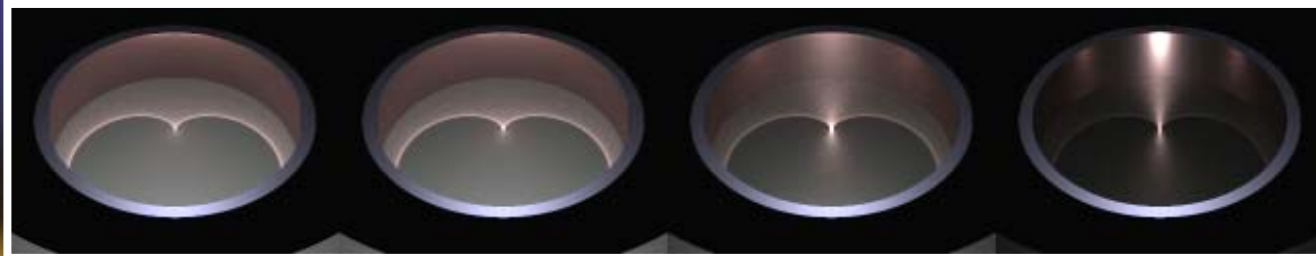




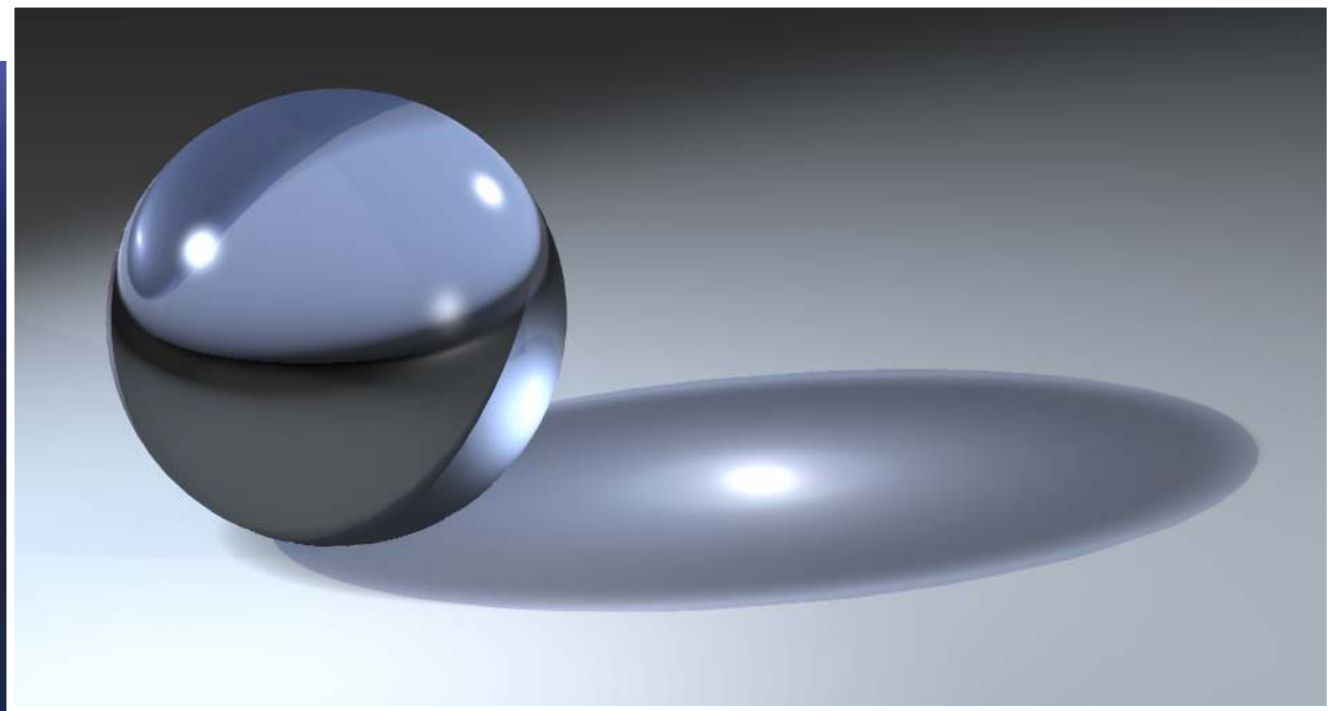
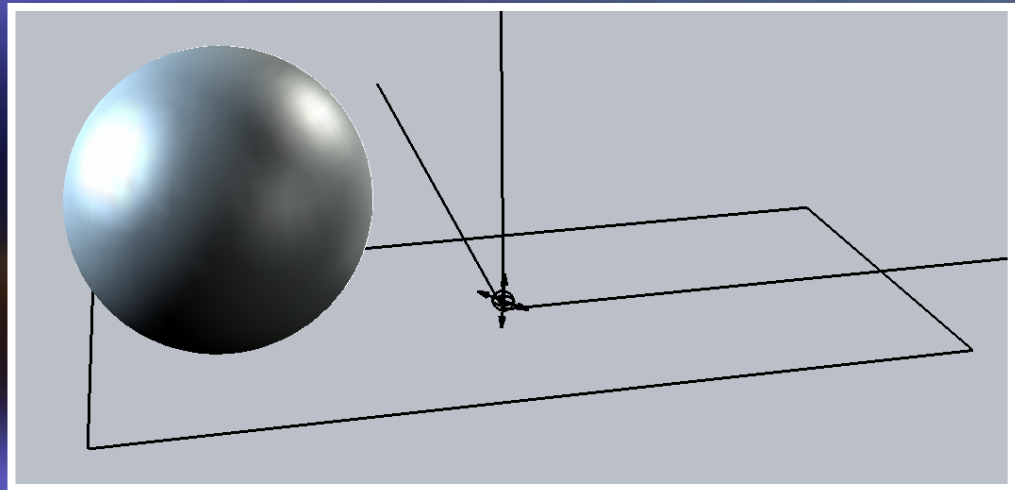
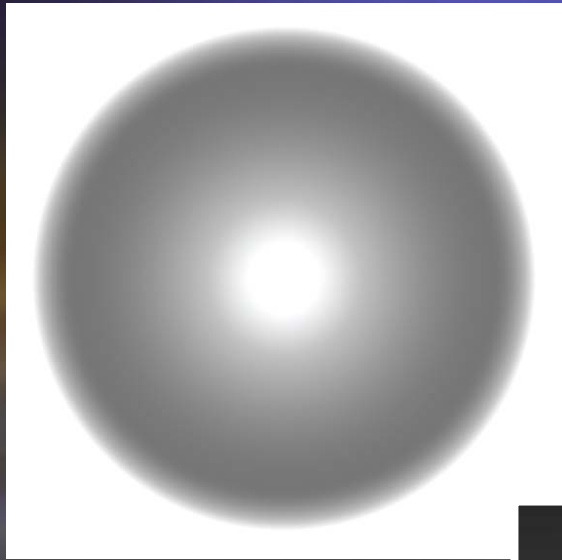
# Fortgeschrittene Beleuchtung: Indirekte Illumination



# Lichtbrennpunkt (Caustics)

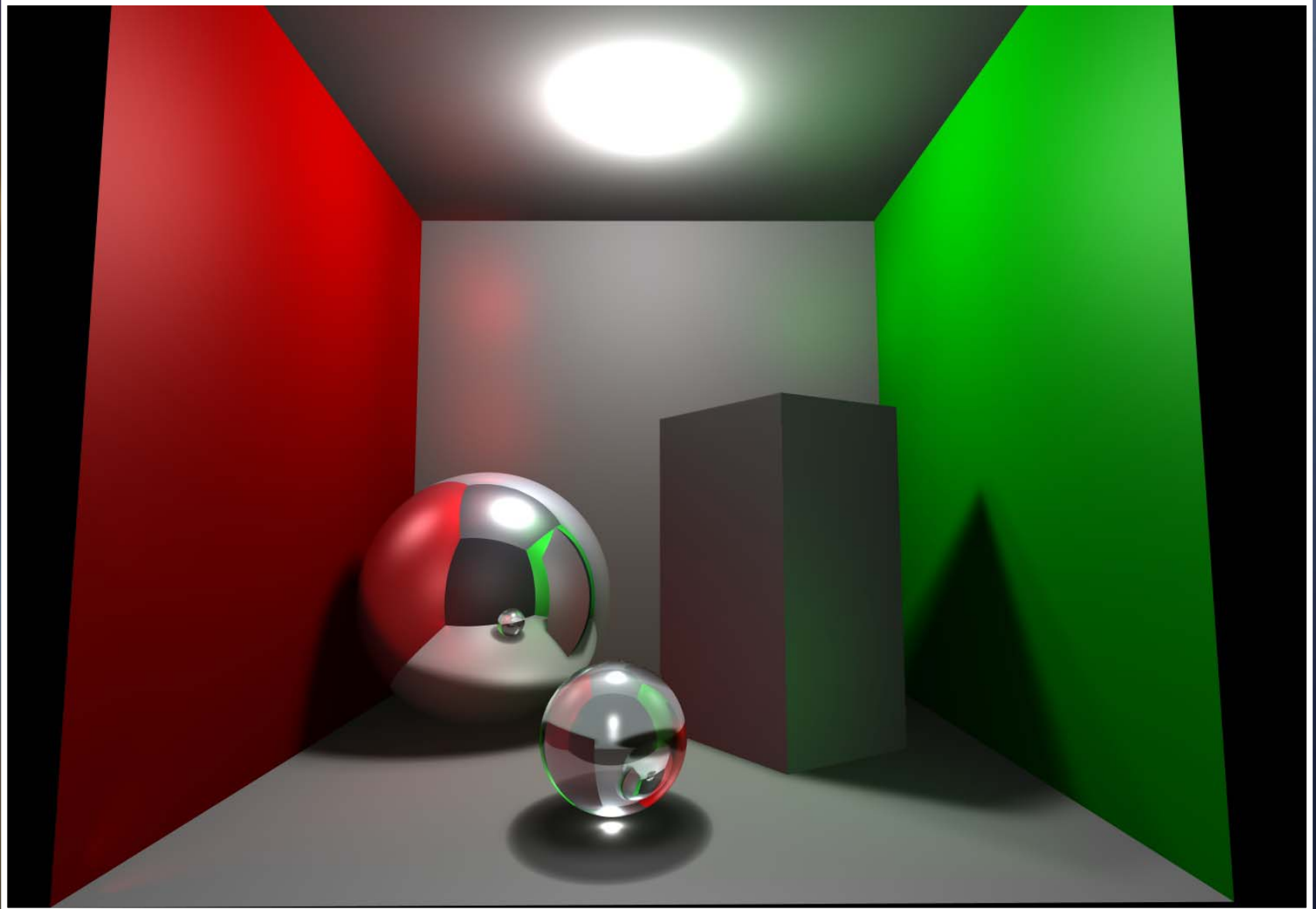


# Lichtbrennpunkt (Caustics)





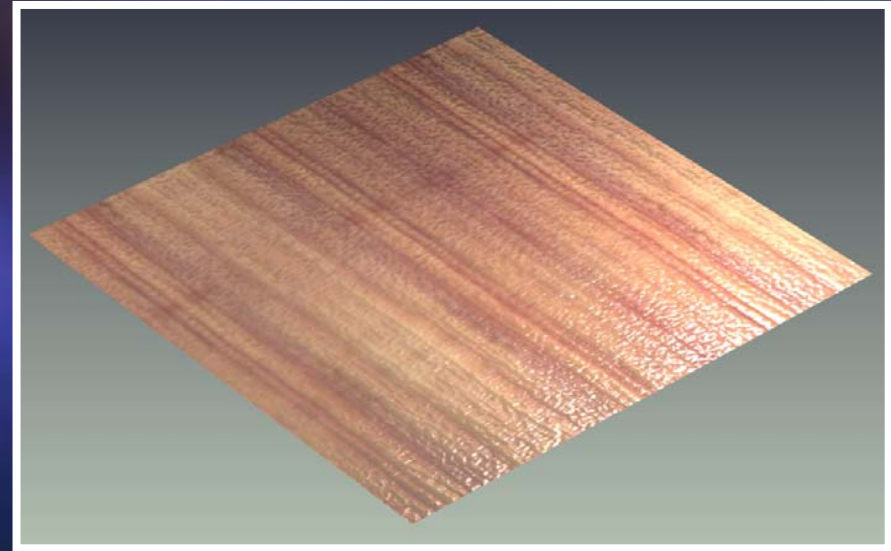
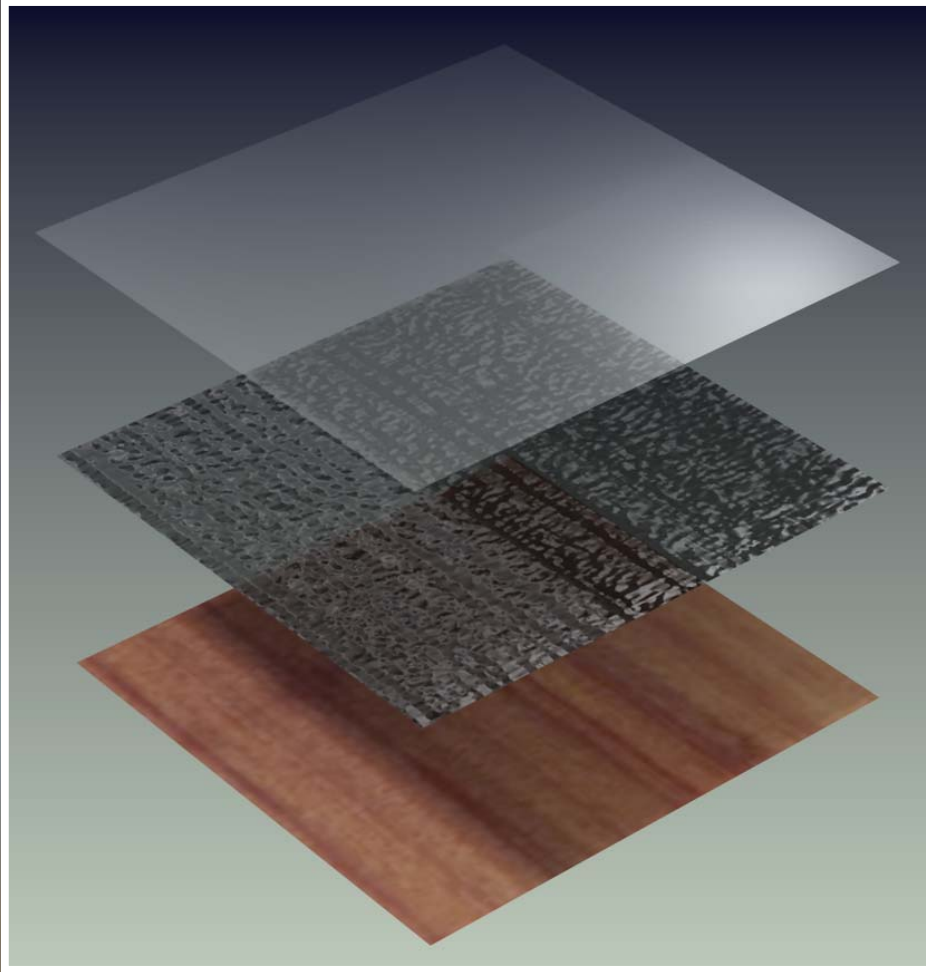
# Lichtbrennpunkt und Indirekte Illumination



Verleihen Sie Ihrer Welt Leben!

# Materialien Texturen

# Materialien sind wie eine Hautschicht





# Attribute der "Reflectance" Kategorie und was Sie bewirken

Ambience

Diffuse

Specular

Roughness

LOW



MEDIUM



HIGH



## **“Reflectance” Attribute Kombiniert**



**LOW**

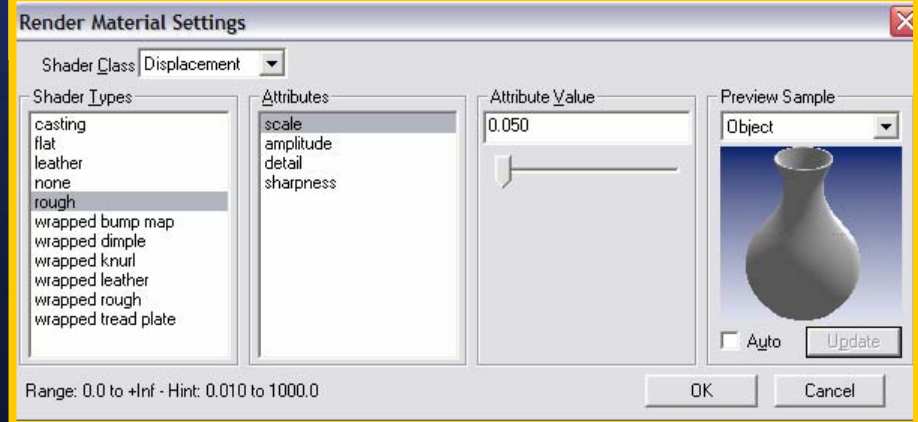
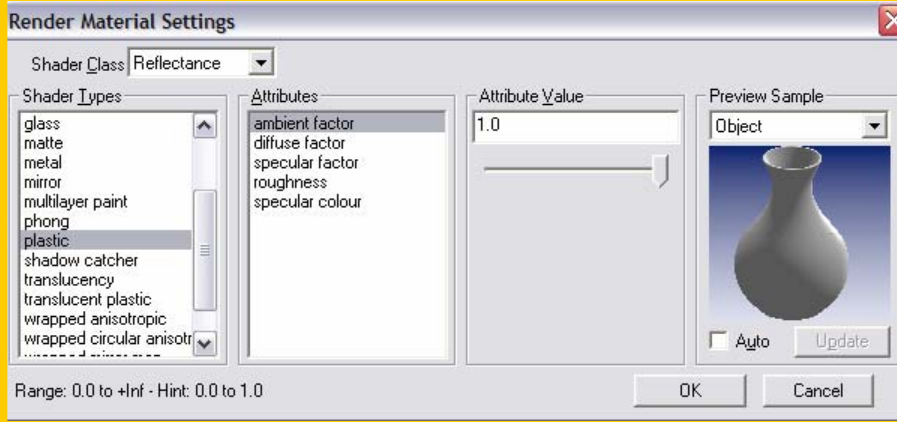


**MEDIUM**



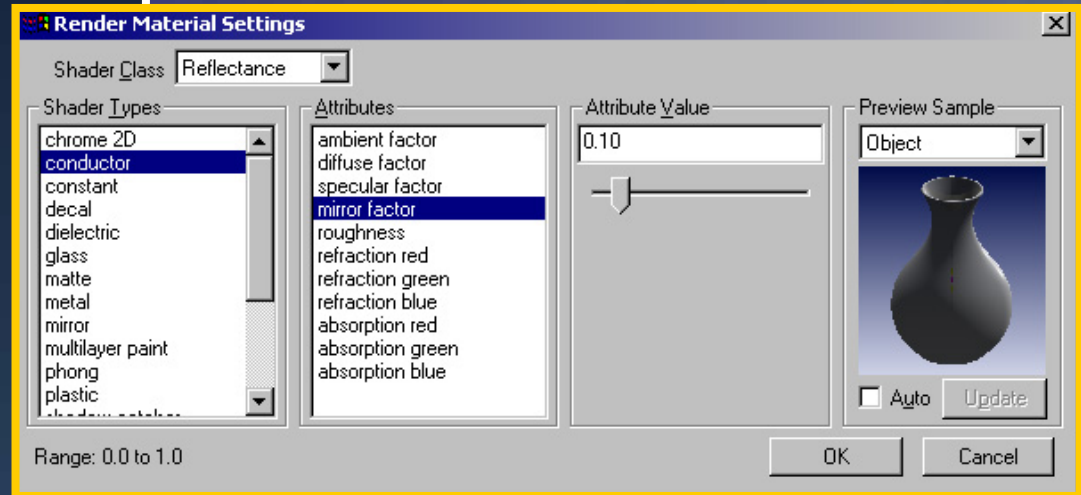
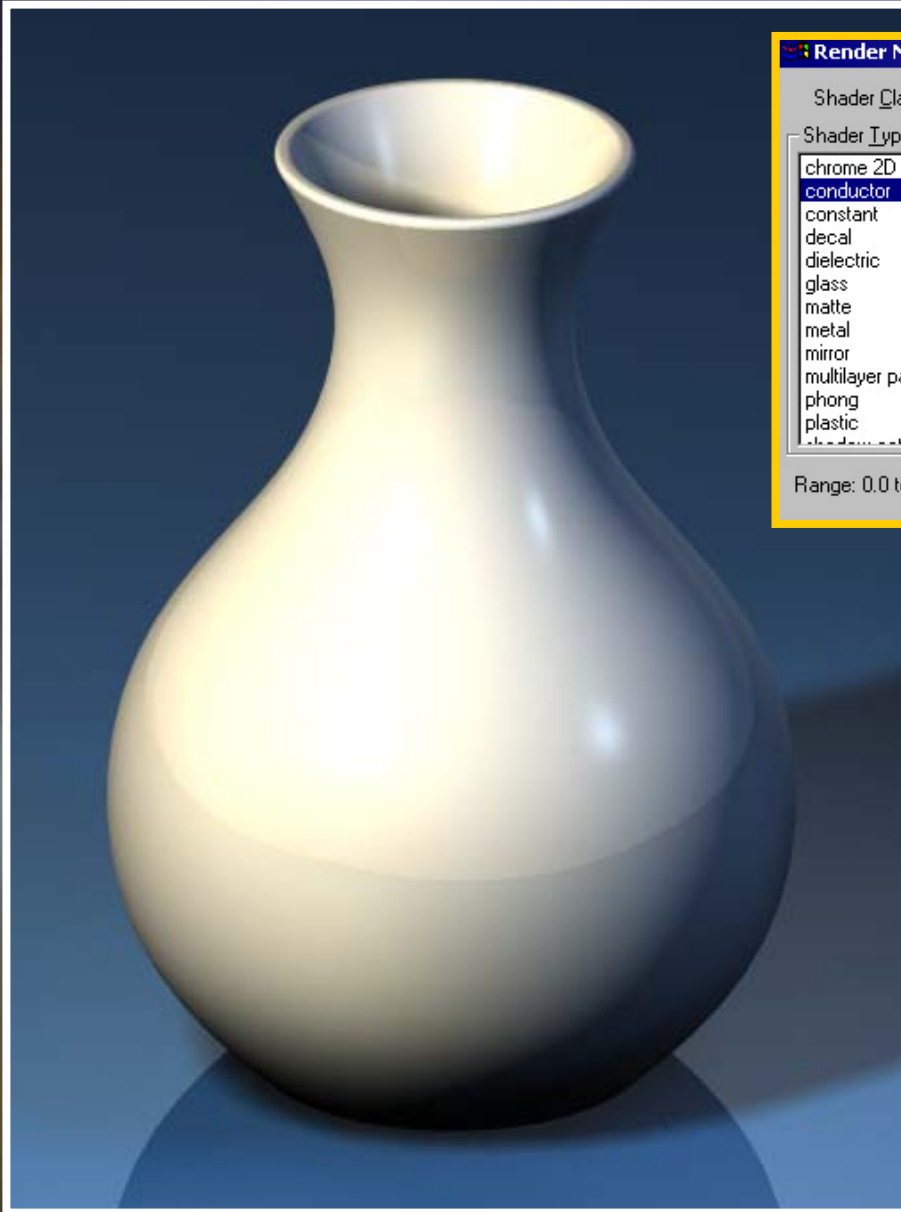
**HIGH**

# Glatter oder unebener Plastik





# Reflektierender Plastik



**Mirror Factor**

## Metall – Basic Reflektion



### Basic Aluminum

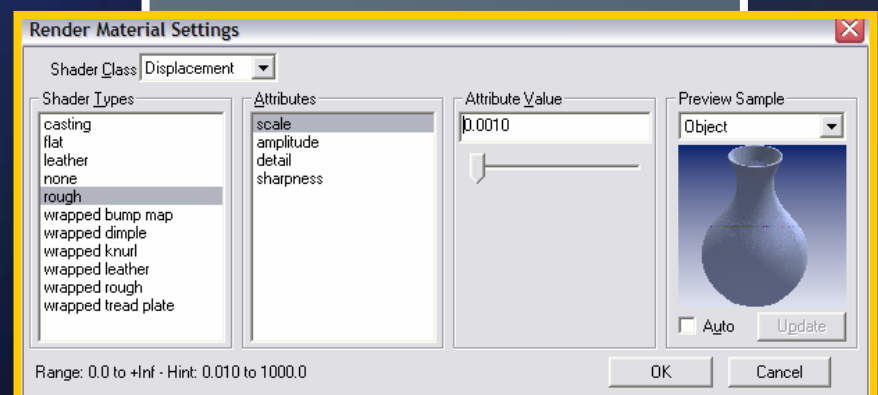
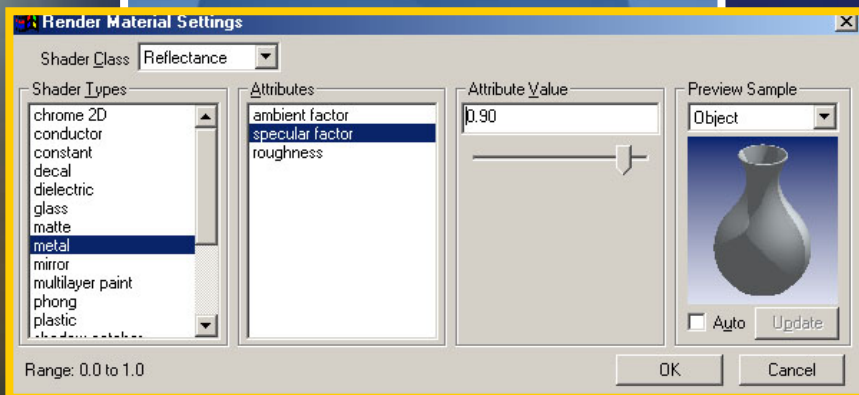
Ambience (.20)  
Diffuse (1.0)  
Specular (.60)  
Mirror (.70)  
Roughness (.02)



### Gold or Brass

Ambience (.20)  
Diffuse (1.0)  
Specular (.60)  
Mirror (.70)  
Roughness (.02)

# Metall – Unbehandelt oder Eloxiert





# Metal - Chrom



**Render Material Settings**

Shader Class: Reflectance

Shader Types: chrome 2D, conductor, constant, decal, dielectric, glass, matte, metal, mirror, multilayer paint, phong, plastic, ...

Attributes: ambient factor, diffuse factor, specular factor, mirror factor, roughness

Attribute Value: 0.0

Preview Sample: Object

Auto

Range: 0.0 to +Inf - Hint: 0.0 to 1.0

# Glas

## Index Refraction für gebräuchliche Materialien

Vacuum - 1.0	Ice - 1.309
Air - 1.0003	Emerald - 1.576
Water - 1.33	Ruby - 1.76
Glass - 1.5174	Sapphire - 1.76
Crystal Glass - 2.0	Opal - 1.45
Acrylic - 1.50	Iodine Crystal - 3.34
Clear Plastic - 1.46	Cubic Zirconia - 2.17
Quartz - 1.544	Diamond - 2.417



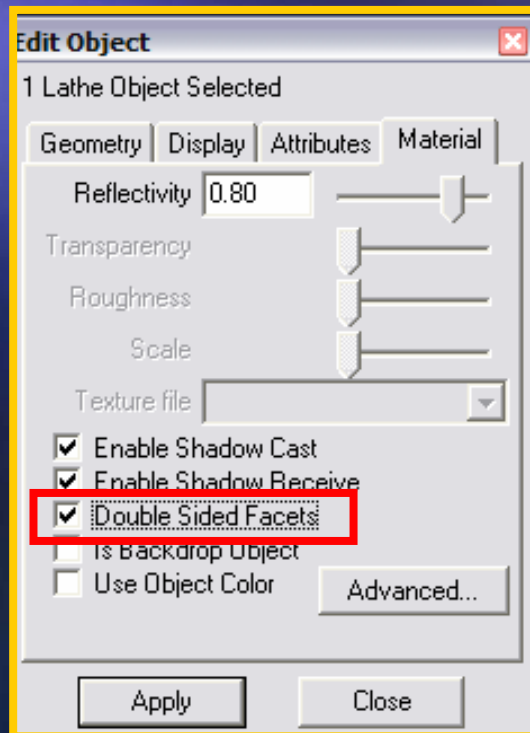
### Basic Glas

Transmission (.93)  
Refraction (1.5174)  
Mirror (.15)  
Specular (1.0)  
Roughness (.003)



### Crystal Glas

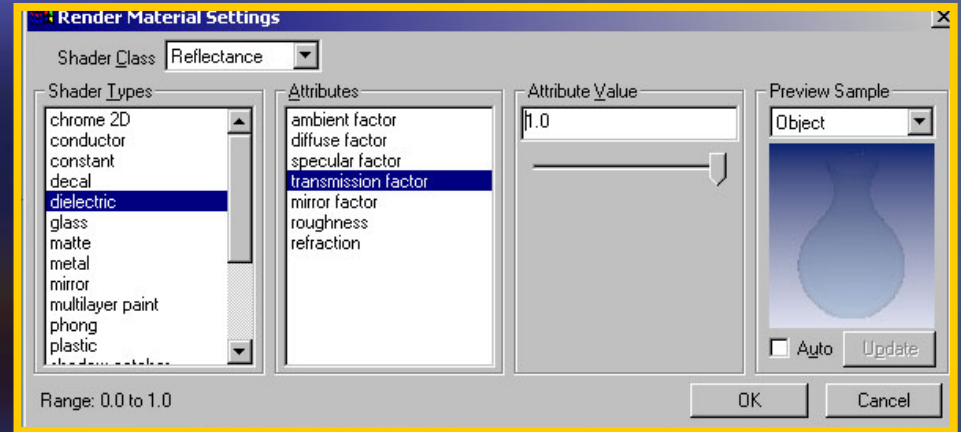
Transmission (1.0)  
Refraction (2.0)  
Mirror (.4)  
Specular (2.5)  
Roughness (.002)



## Glas - Beispiel



# Klarer Plastik



## Acrylic

Transmission (1.0)

Refraction (1.4)

Mirror (.8)

Specular (1.0)

Roughness (.005)

Diffuse (1.0)

Ambience (1.0)





## Image basierte Texturen – Brushed Metall

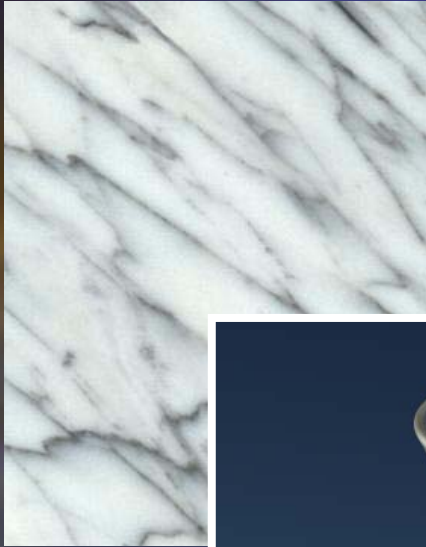


## Image basierte Texturen – Holz

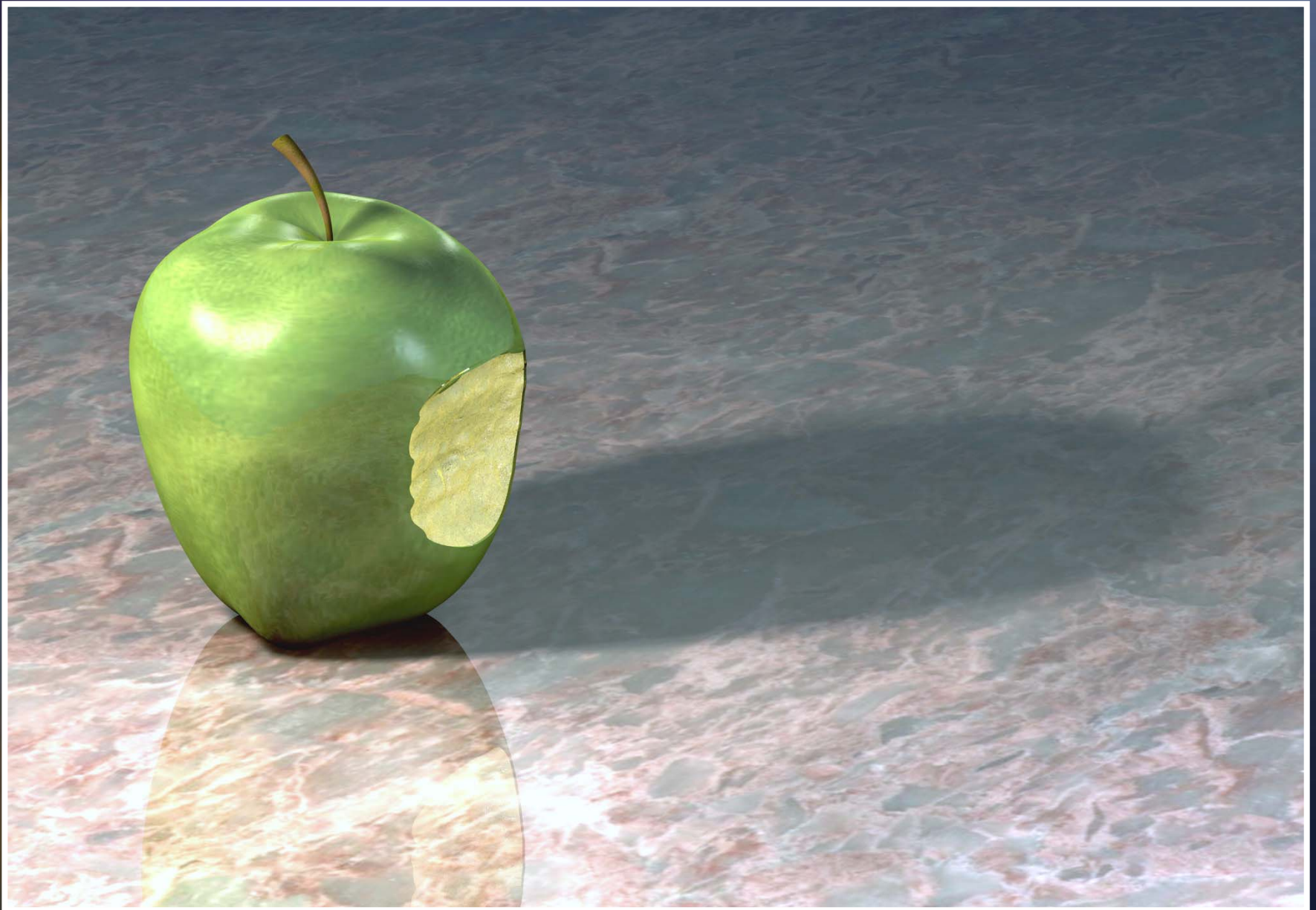




## Image basierte Texturen – Marmor und Stein



## Image basierte Texturen – Beispiel

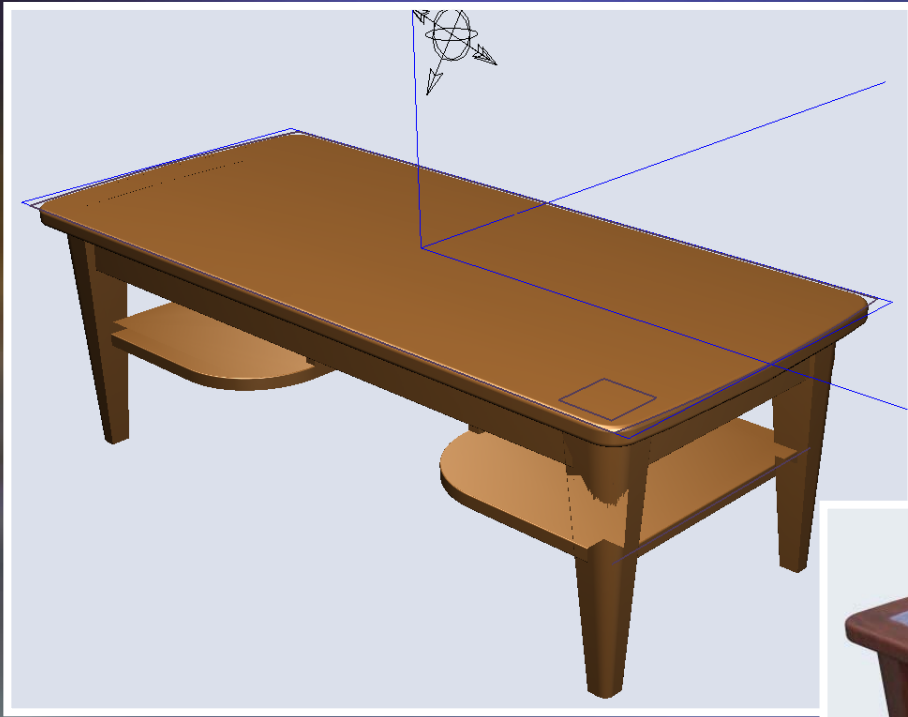




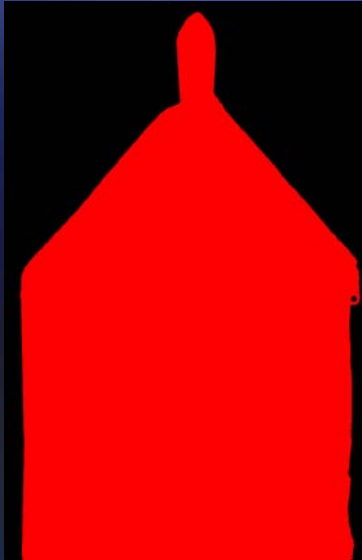
## Image basierte Textures – Beispiel



# Abbilder Decals



# Abbilder Decals



**Erstellen Sie nun Ihre eigene  
virtuelle photorealistische Welt  
mit Cobalt Xenon und Argon**