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4.500 Introduction to Design Computing
Fall 2008

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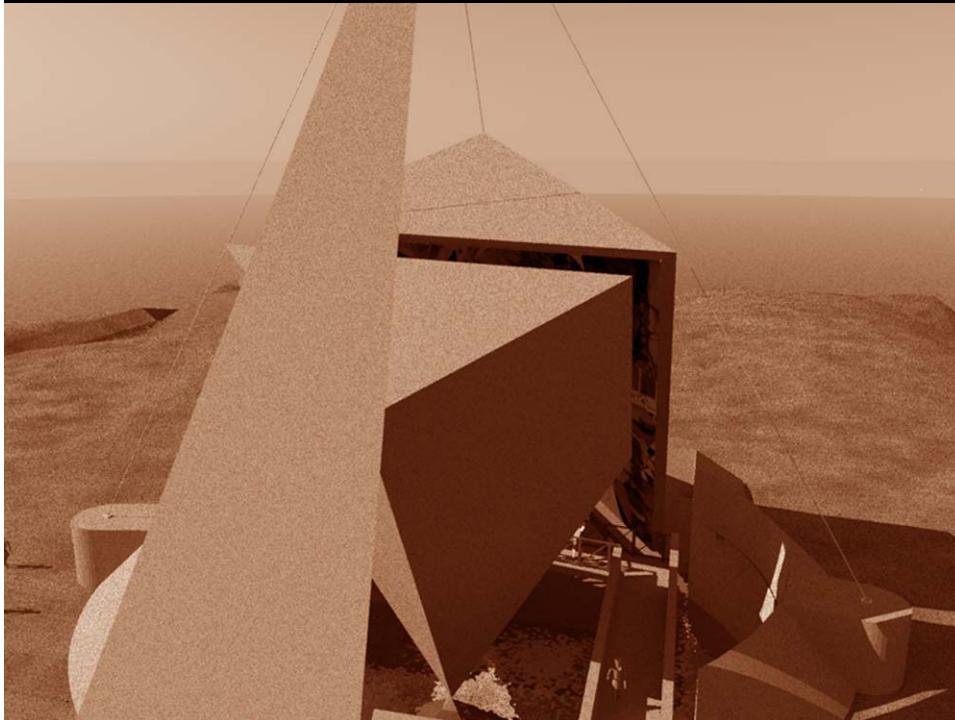
4.500

Computing Rendering

1. *Why do Architects Render*
2. *Technical Components of Rendering*
3. *Illuminating a Model*

Rendering in Architecture

- *Test Design Quality & Performance*
- *Test Quantitative Performance*
- *Present Information*
- *Renderings have different purposes*



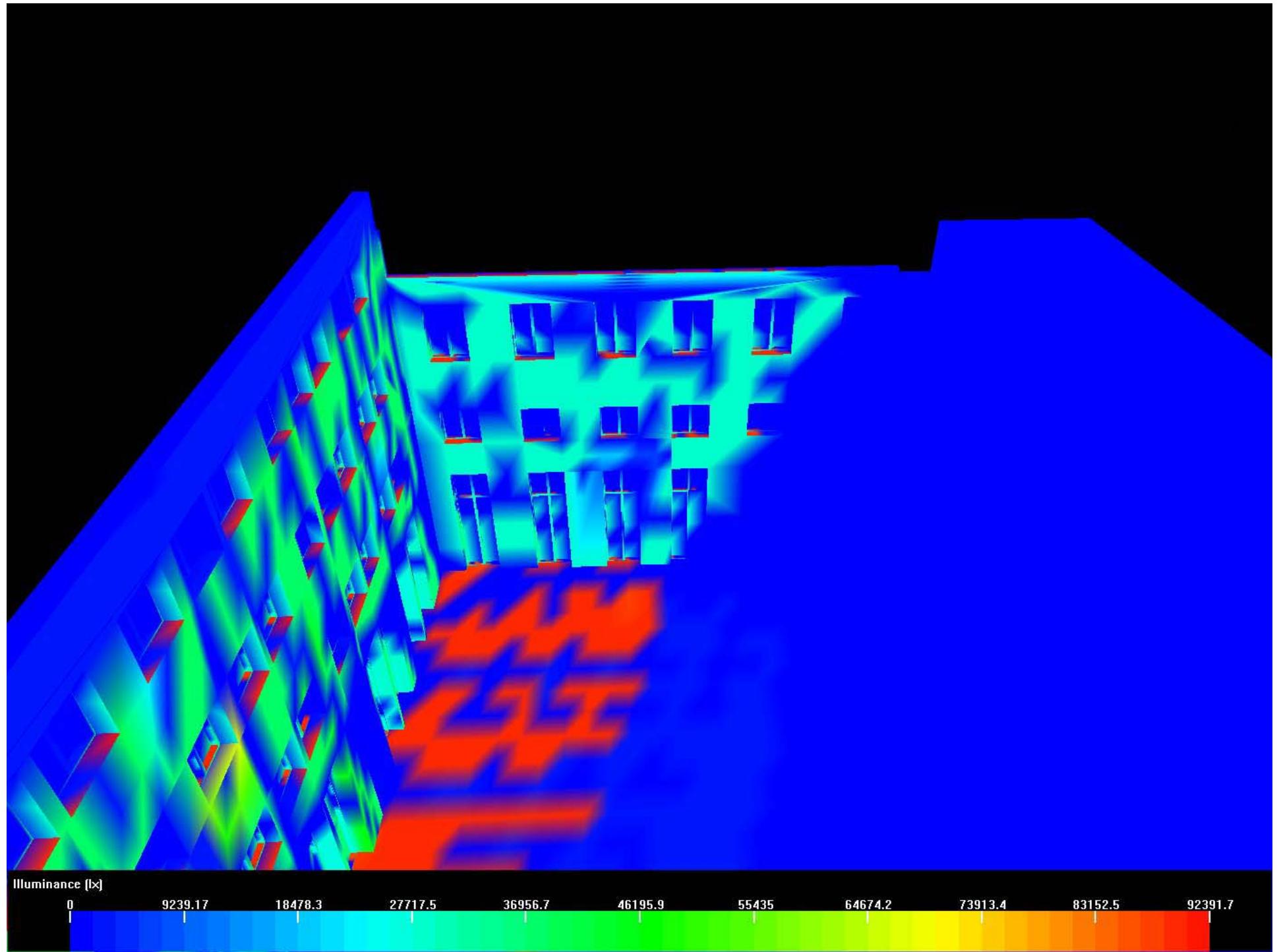


Purpose of Rendering

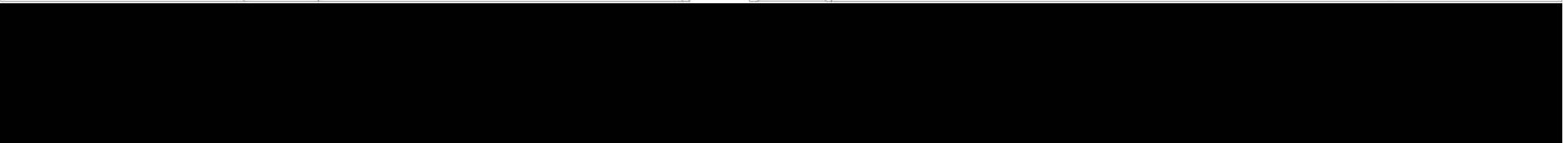
- *Providers of Light to Models Constructed of Lines*
- *Present Design Possibilities*
- *Software: Most are Rendering and Modeling Packages are Bundled Together*

[*Quality Vs Quantity*]





[Designing Colors]











[Designing Artificial Lights]

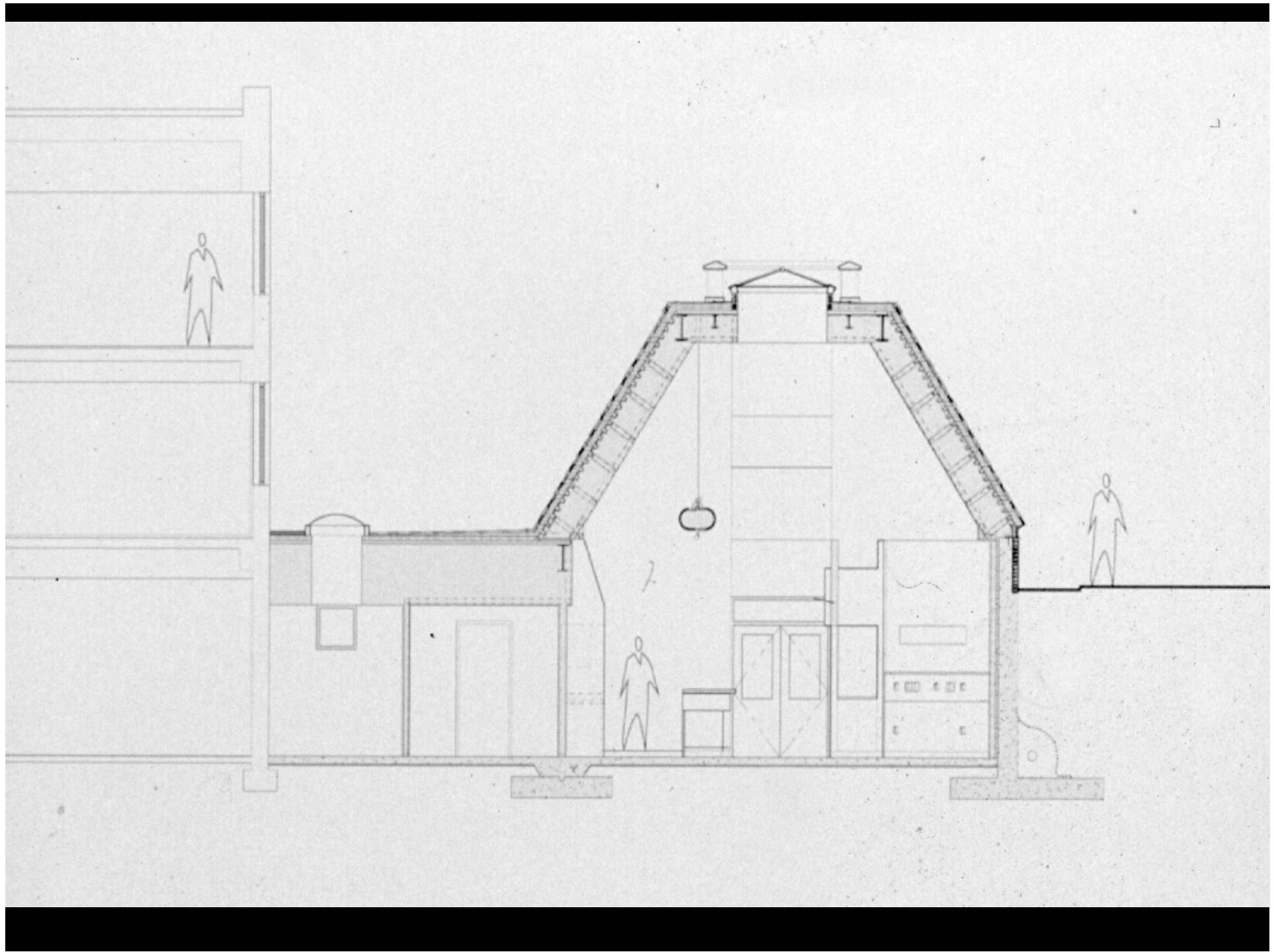








[*Designing Natural Light*]











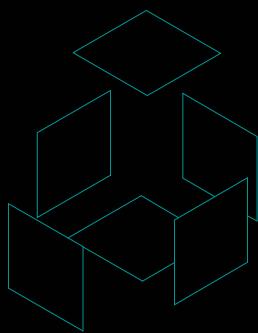
Summary of Rendering Qualities

- Capturing Light & Shadow
- Find the right balance of color and depth
- Scaling - Texture

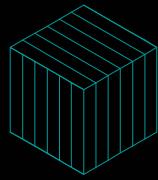
Technical Components of a Rendering

- **Lighting Algorithm**
- **Surface Treatment – Texture Maps**
- **Image Manipulation – (Photoshop)**

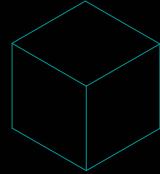
Model Representations



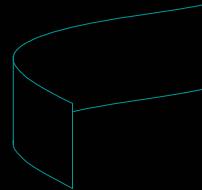
Surface Models



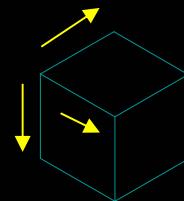
Ruled Surface



Solid Modeling

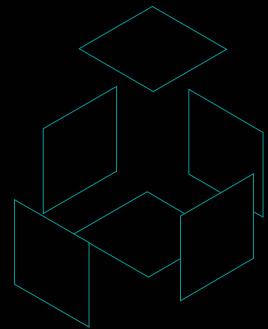


NURB Surface
Modeling

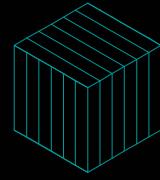


Parametric
Modeling

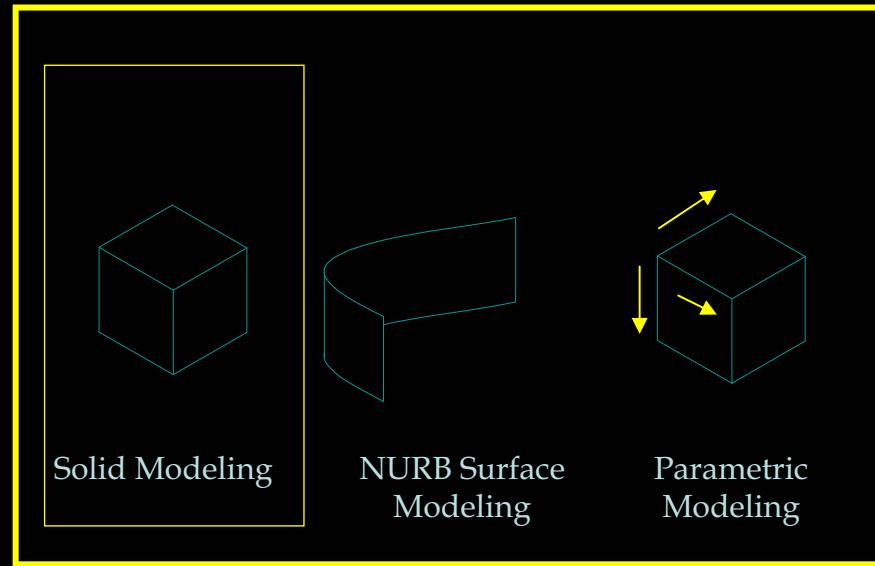
Model Representations



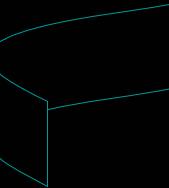
Surface Models



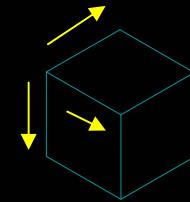
Ruled Surface



Solid Modeling

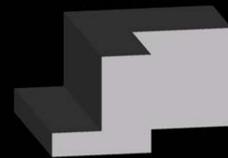


NURB Surface
Modeling



Parametric
Modeling

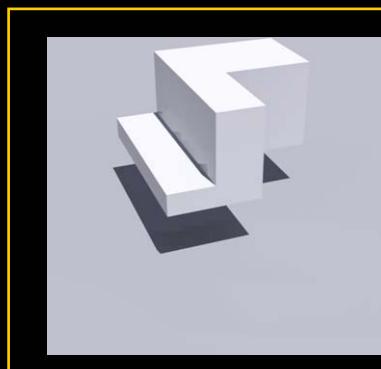
Rendered Representation



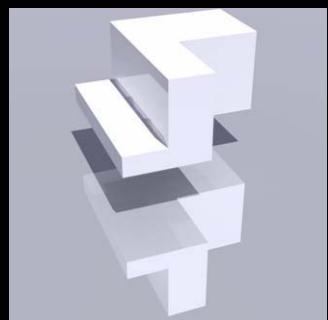
Geometrical
Representation

Hidden Line

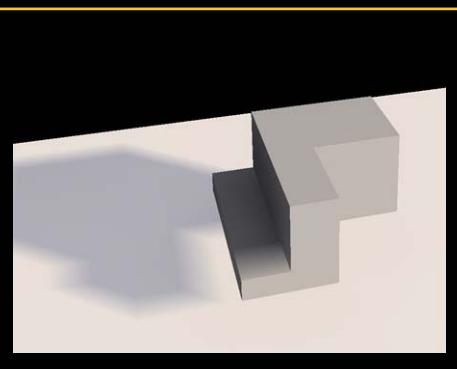
Shading



Render



Raytrace



Radiosity

Axonometric Projections

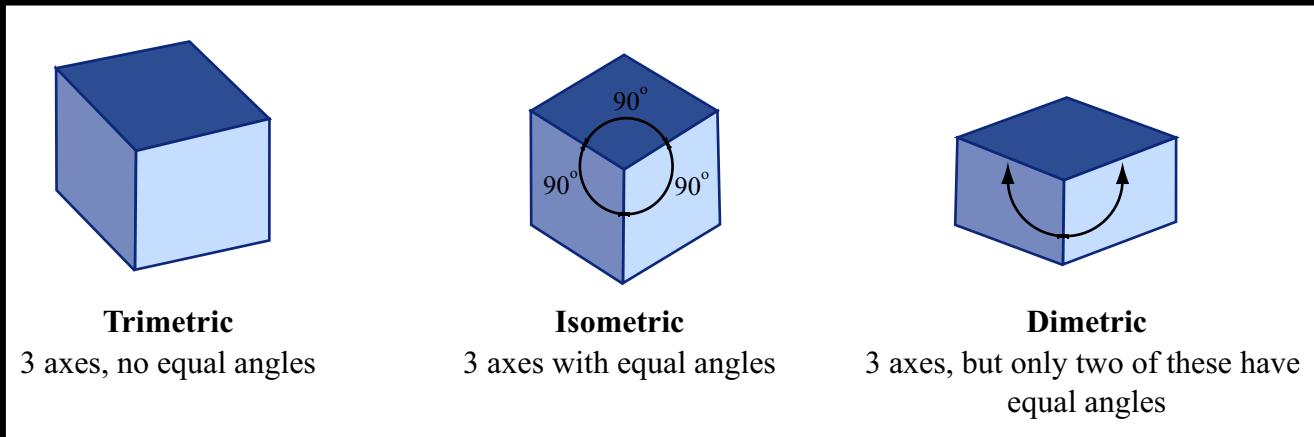


Figure by MIT OpenCourseWare.

Rendering Components

1 - Modeling

2 - Rendering

Lights

Spots

General

Day lighting

Cameras

Lens Manipulation

Change in Location

Operations on Surfaces

Shading

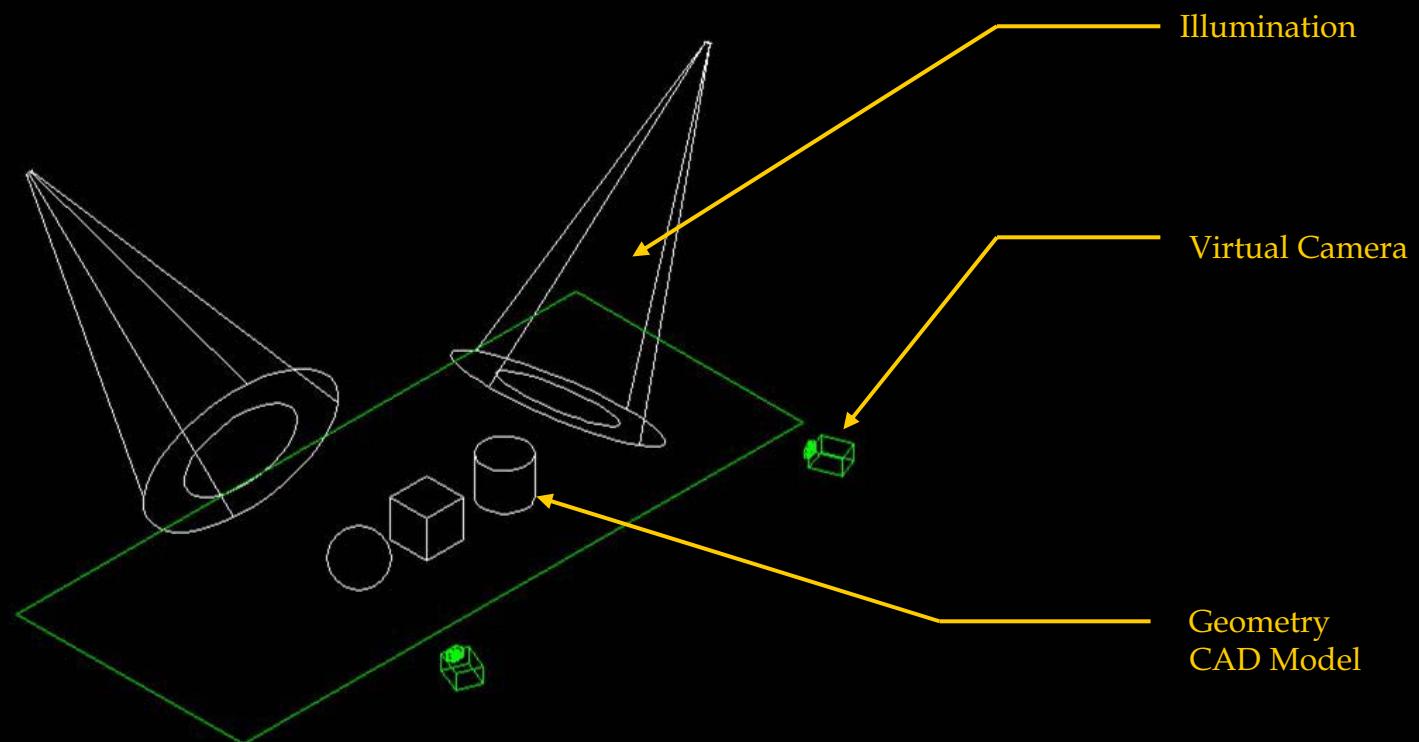
Ray Tracing

Textures

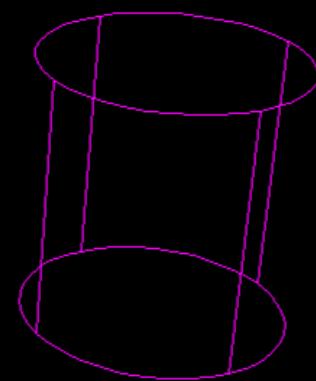
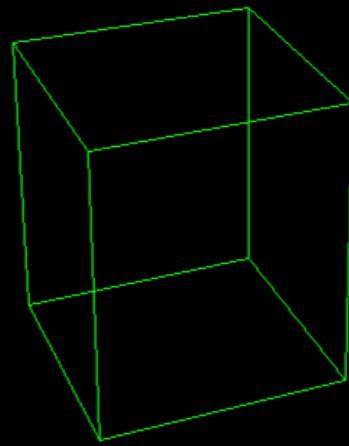
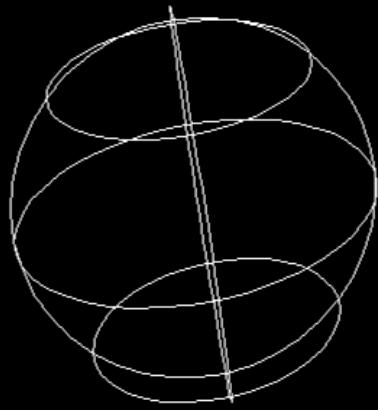
Maps

3 - Animation

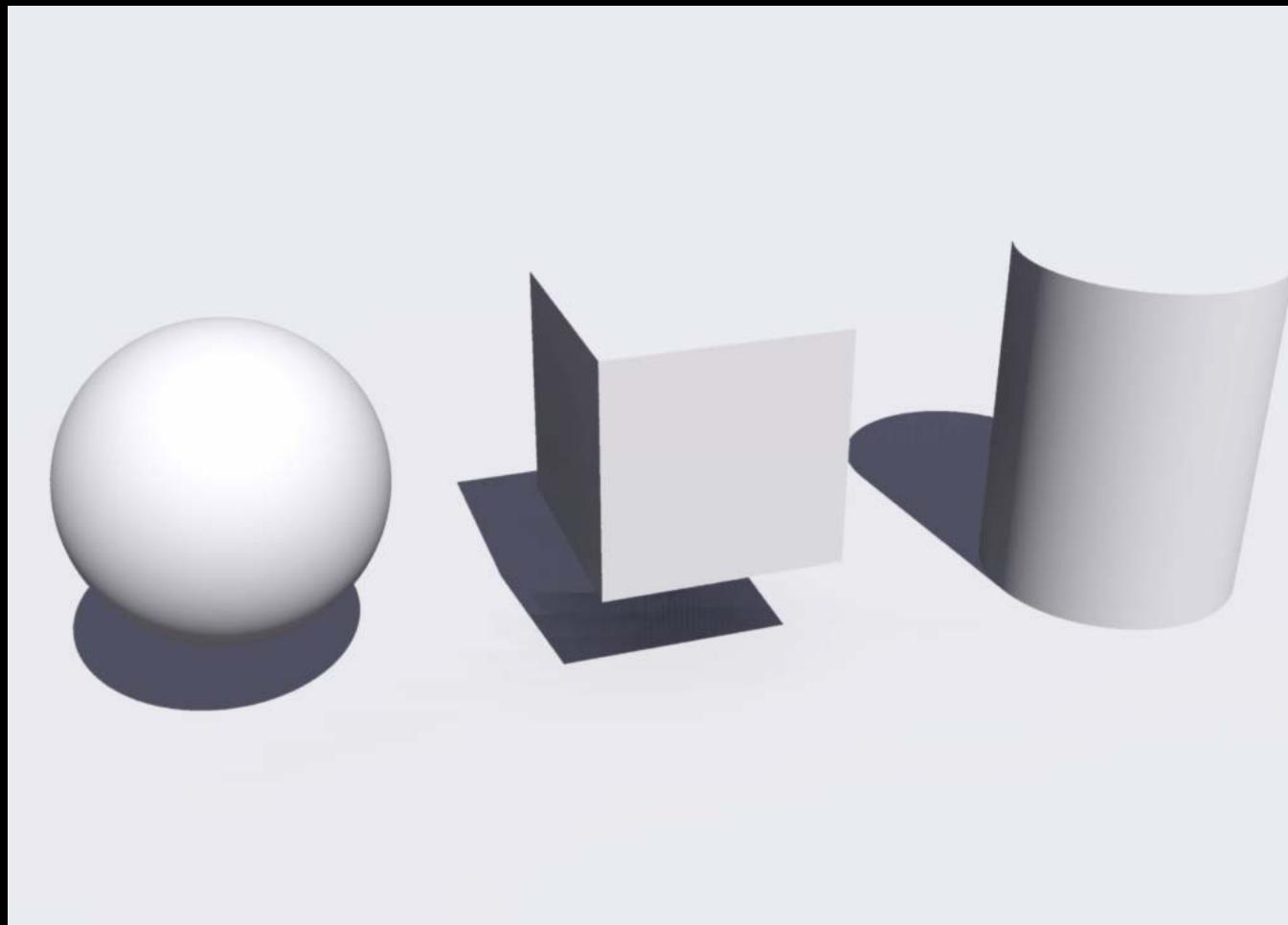
Rendering Scene



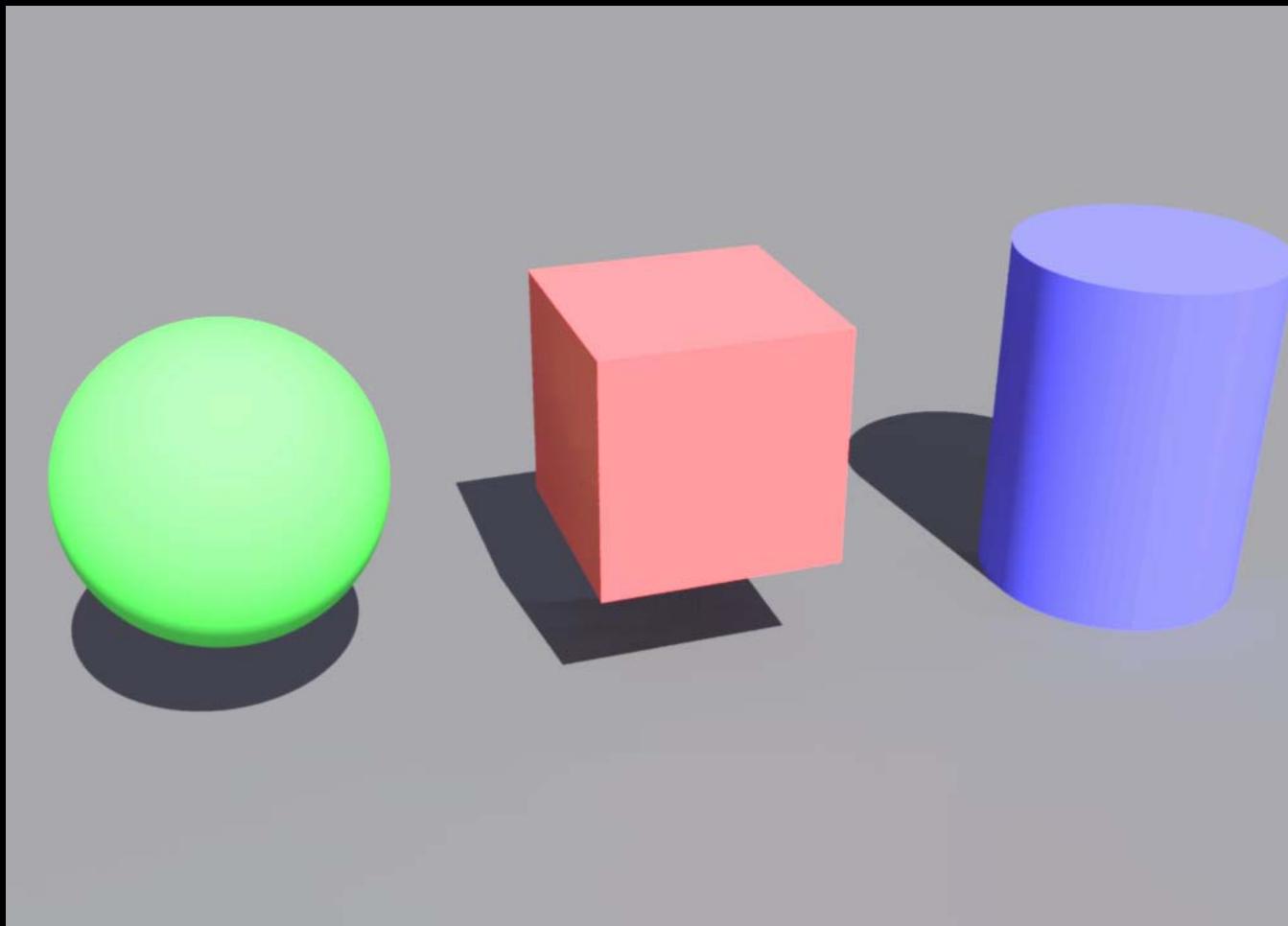
Surfaces - Wire Frame



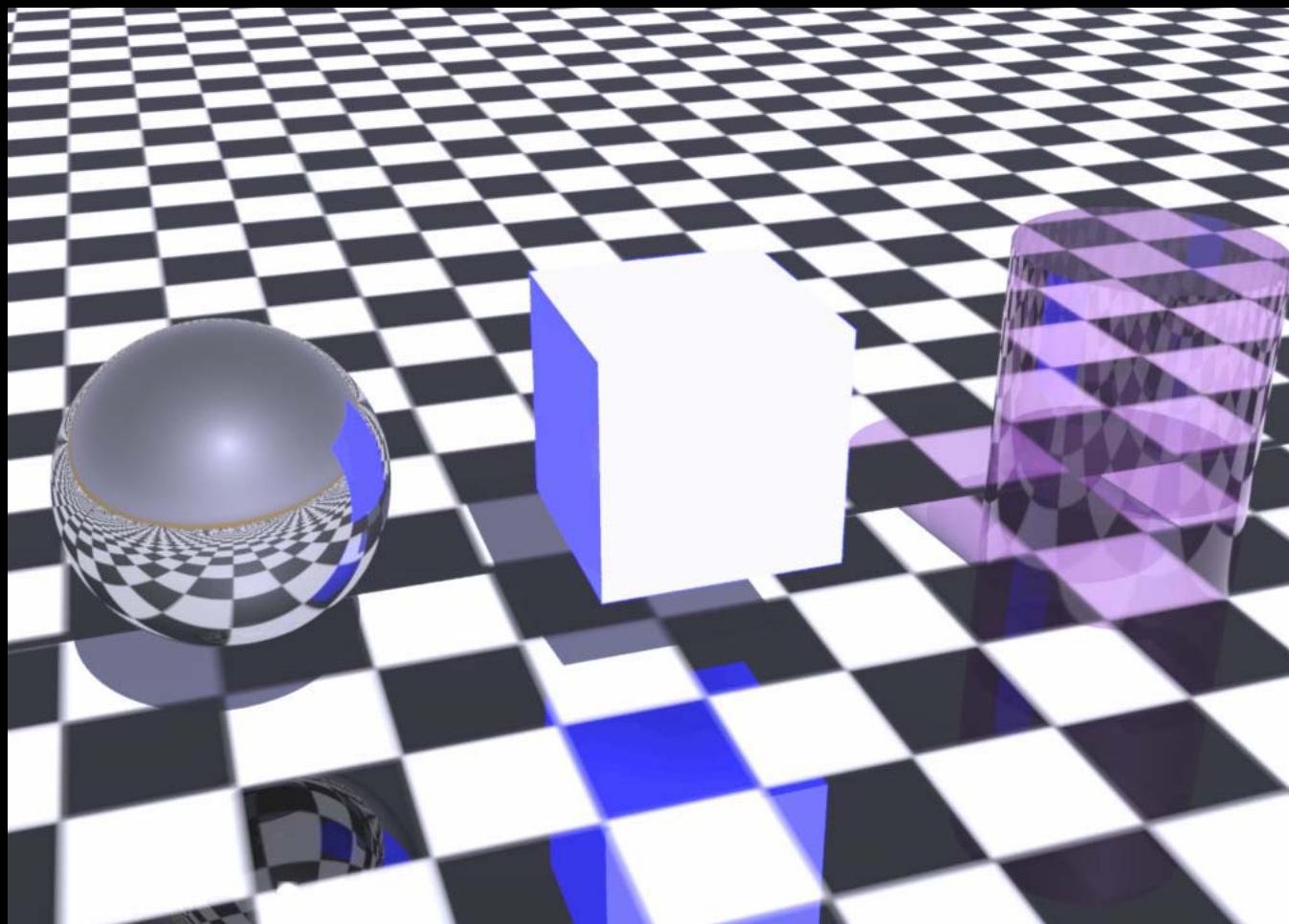
Surfaces - Shading



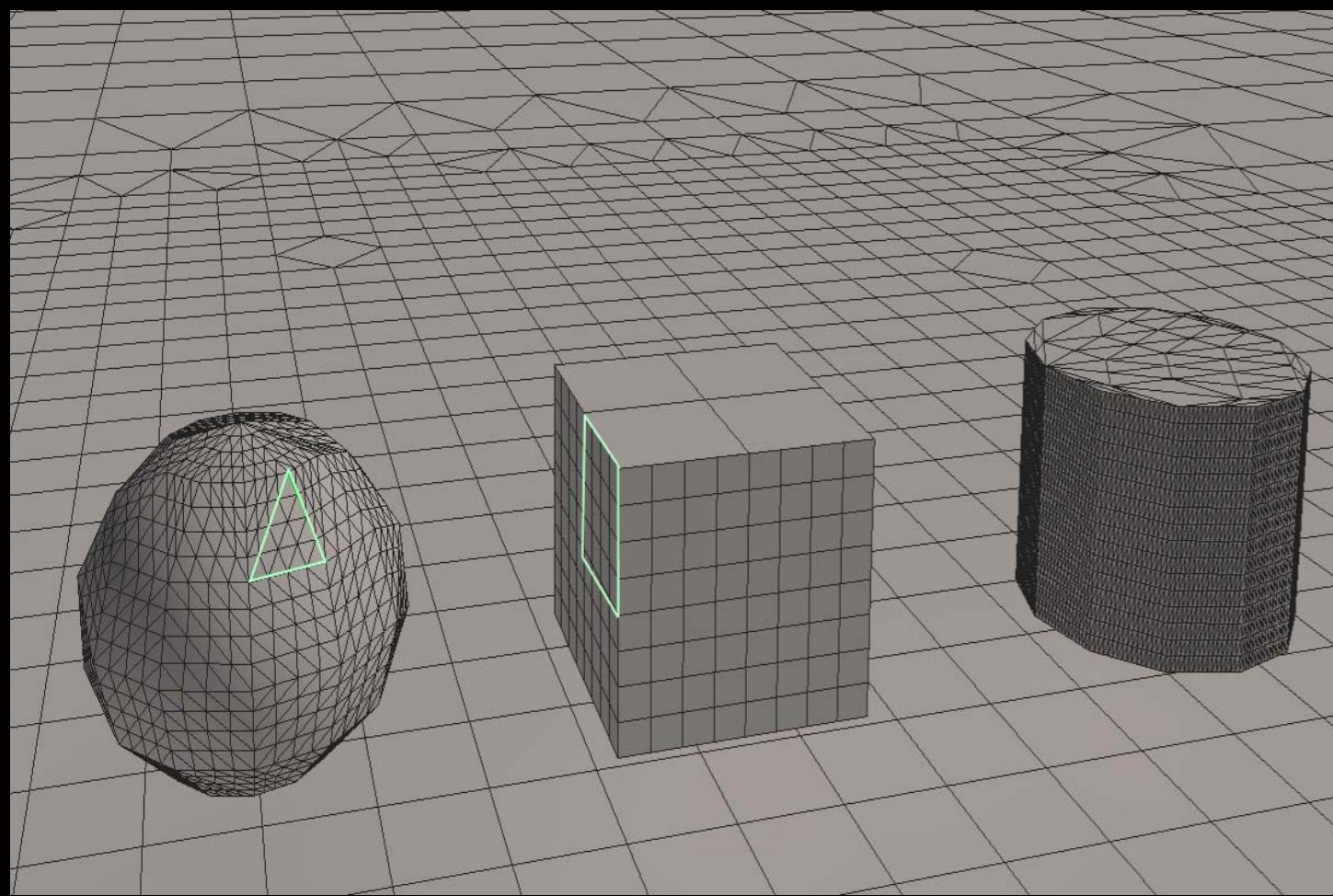
Surfaces - Color



Surfaces – Ray Tracing



Surfaces - Radiosity



Surface - Textures And Maps

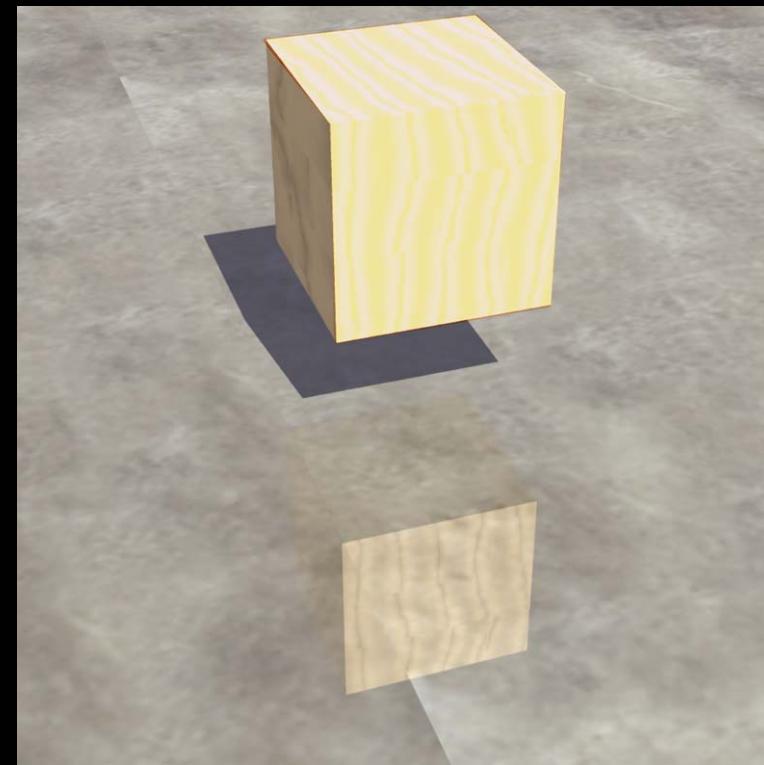
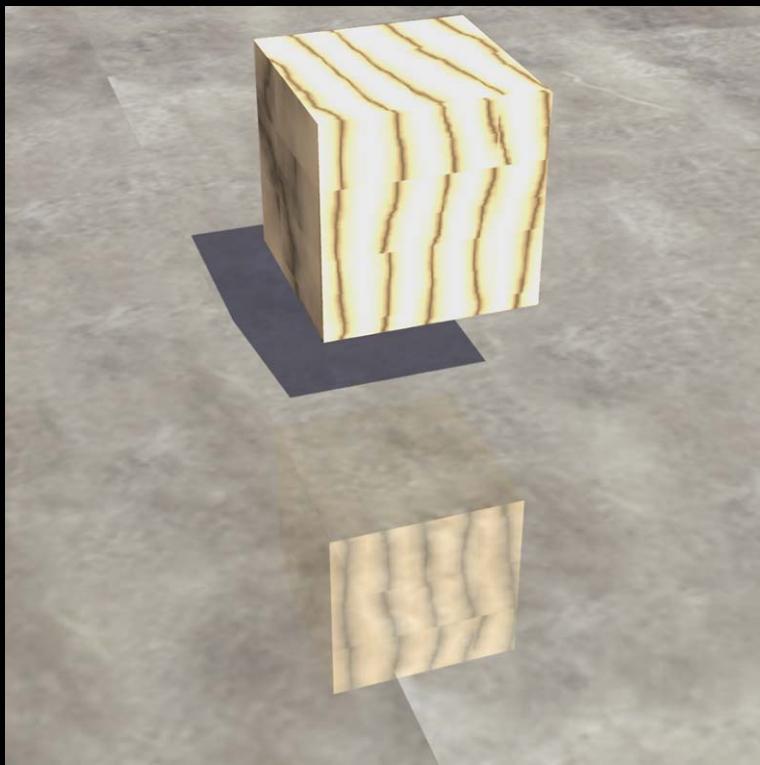
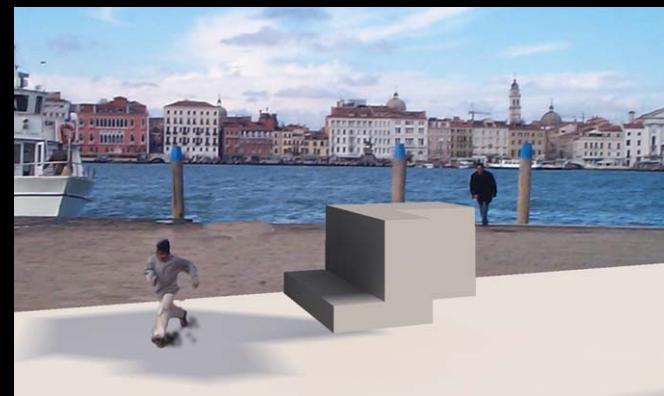
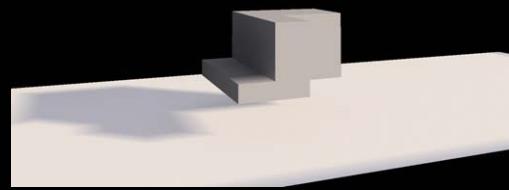


Image Manipulation

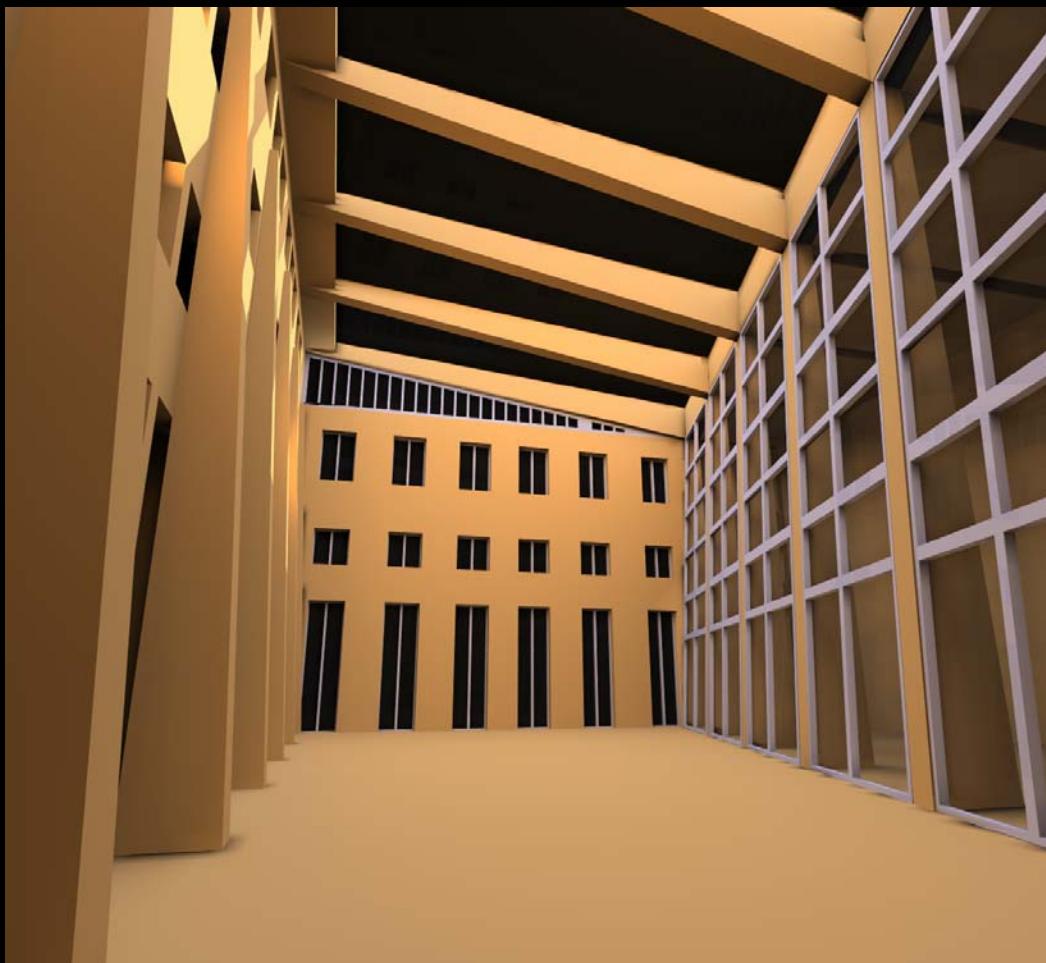


Illumination

- Import a Model
- Setting up Lights
- Setting up Cameras
- Creating an Image

Rendering Process

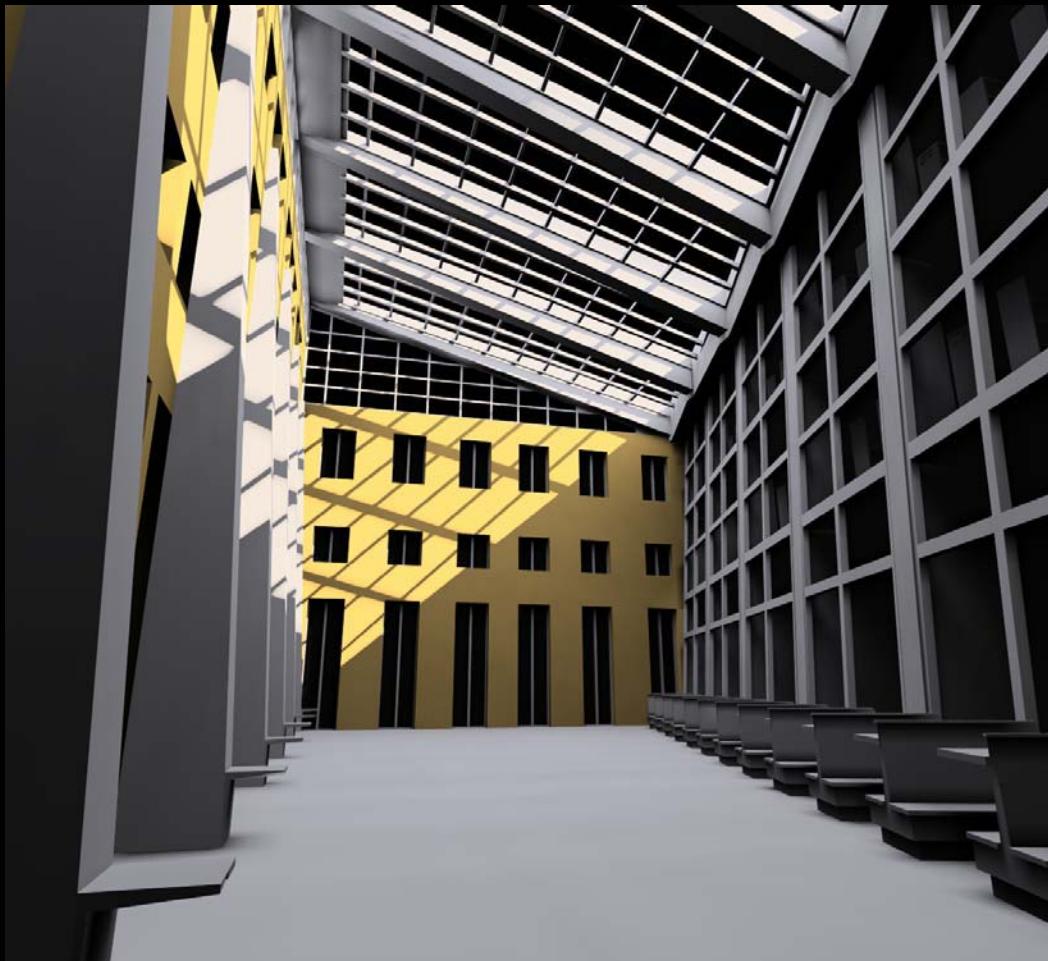
Mono Chromatic Model



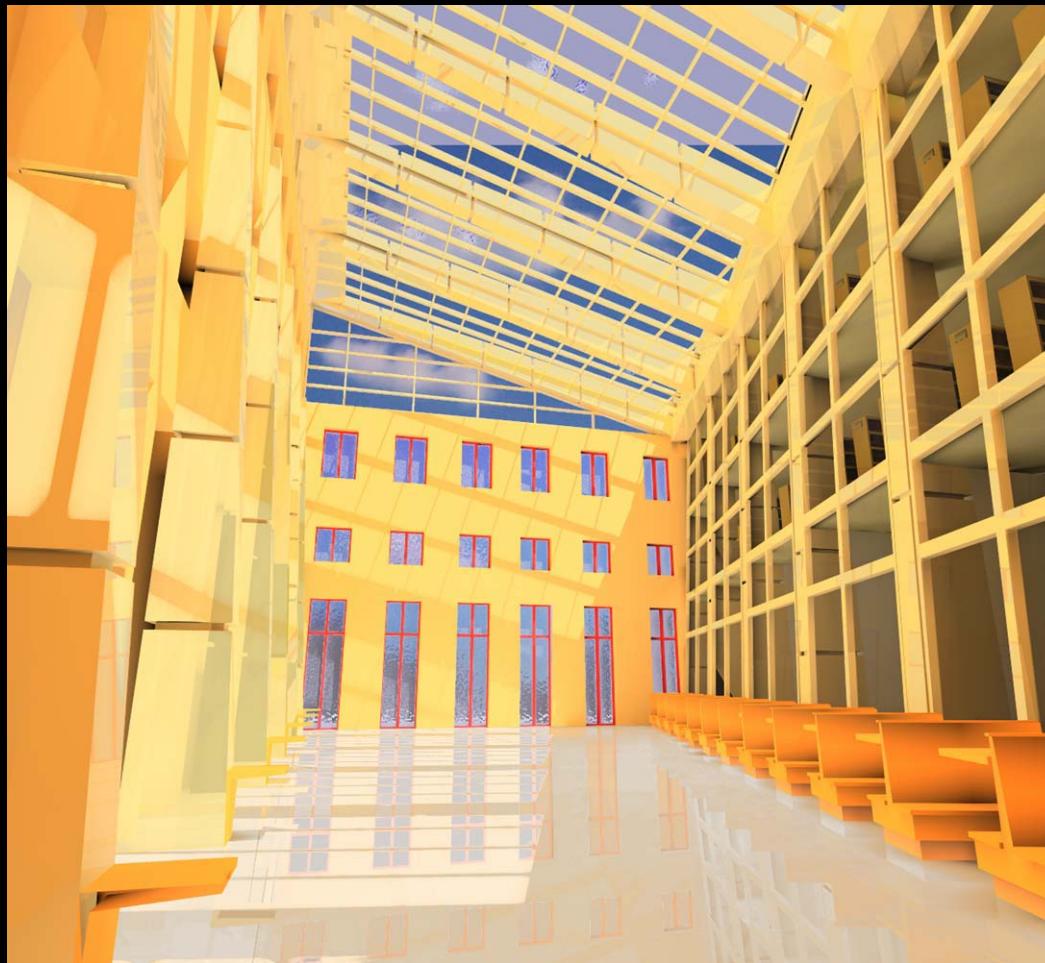
Mono Chromatic Model



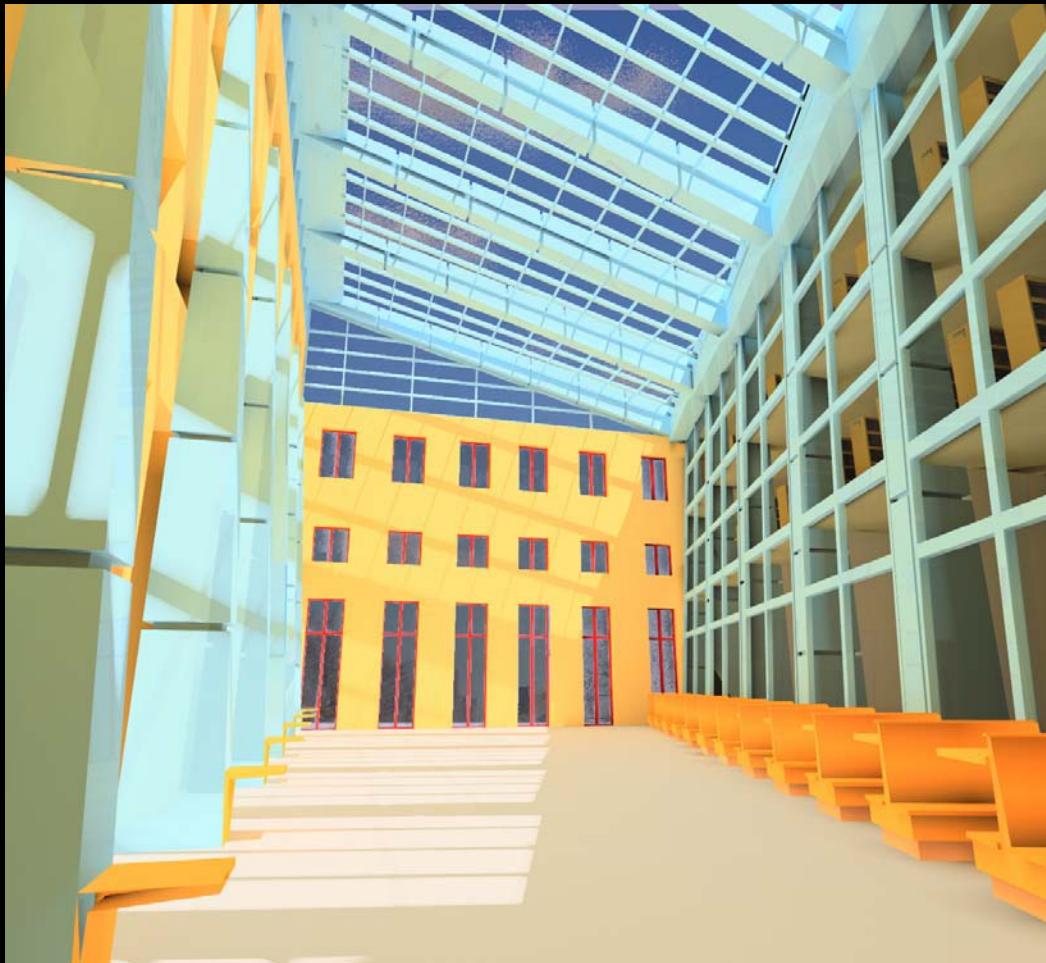
Color and Light Model



Surface and Light



Color and Light



Color and Light



Light & External Textures



Texture Maps



Final Camera Views

