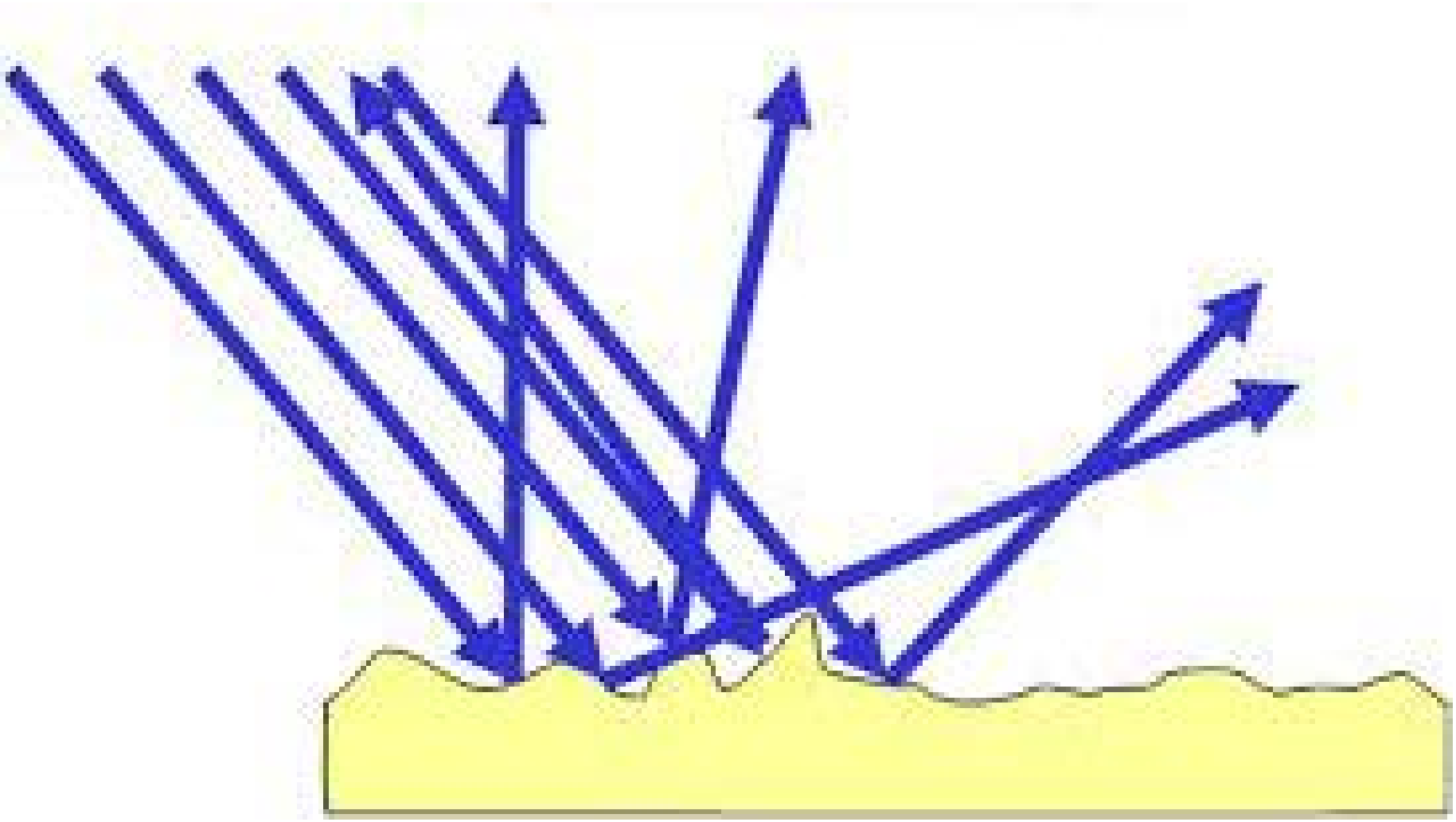
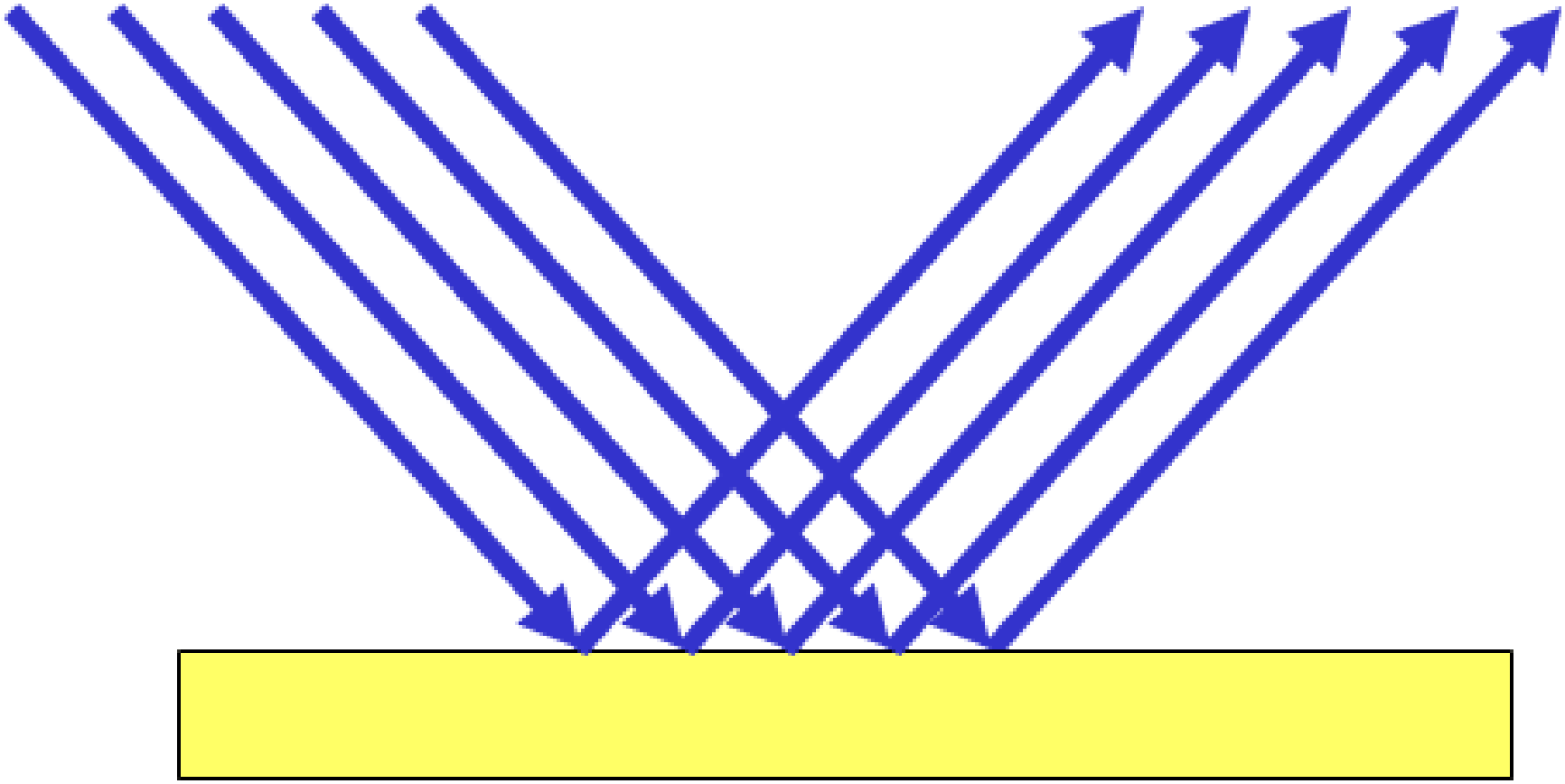
LIGHT and COLOR

Part 1 of 2

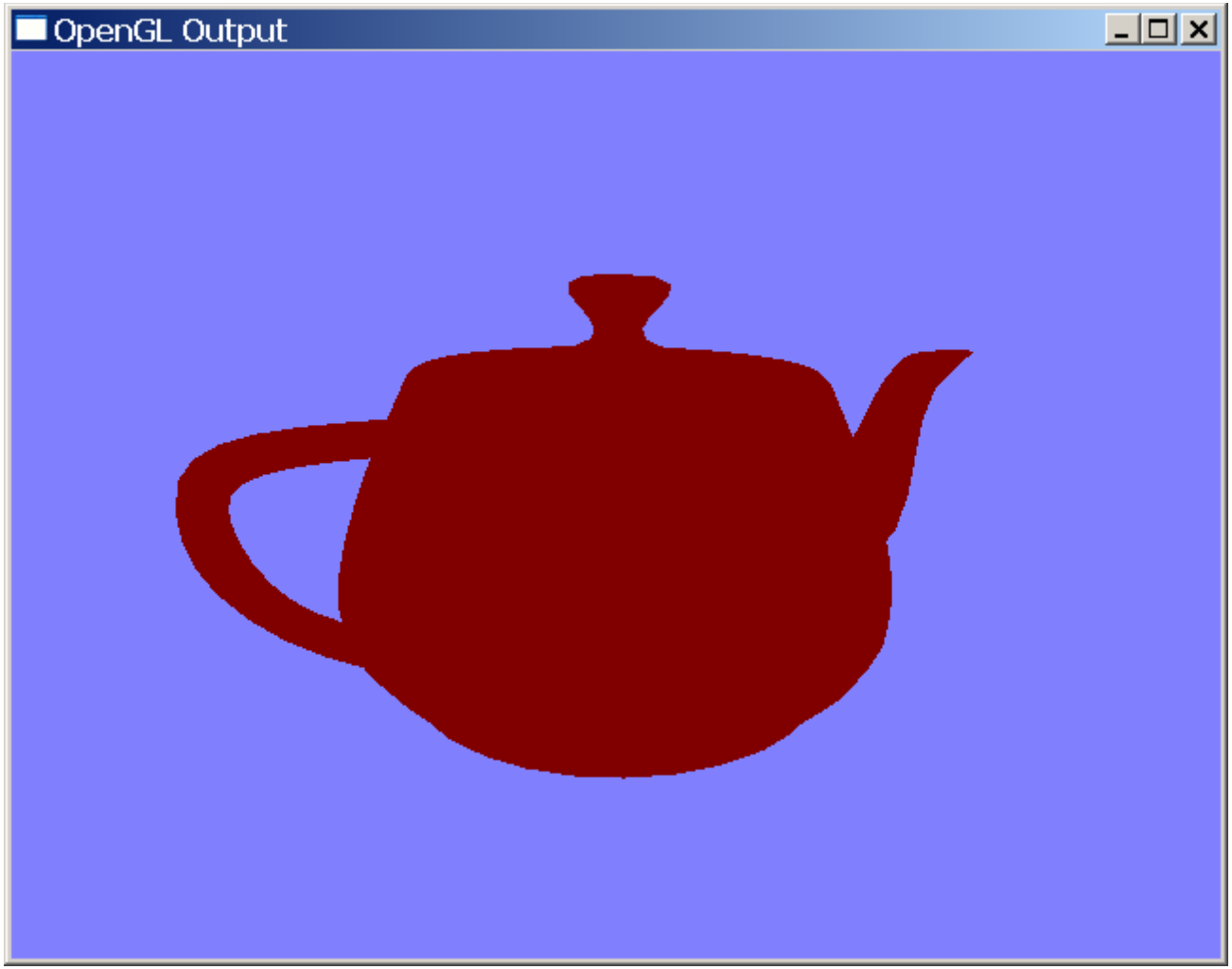
Diffuse reflection



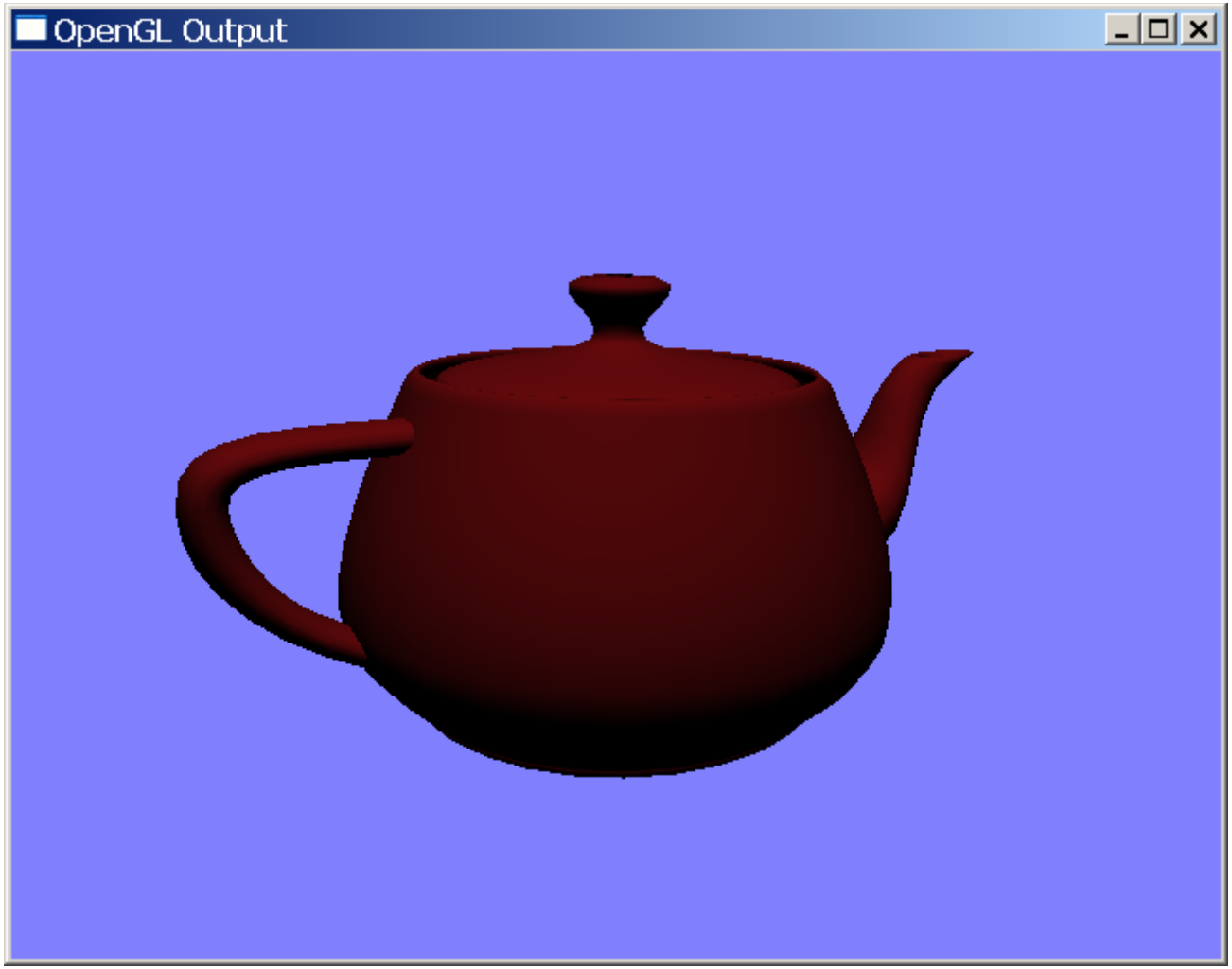
Specular reflection



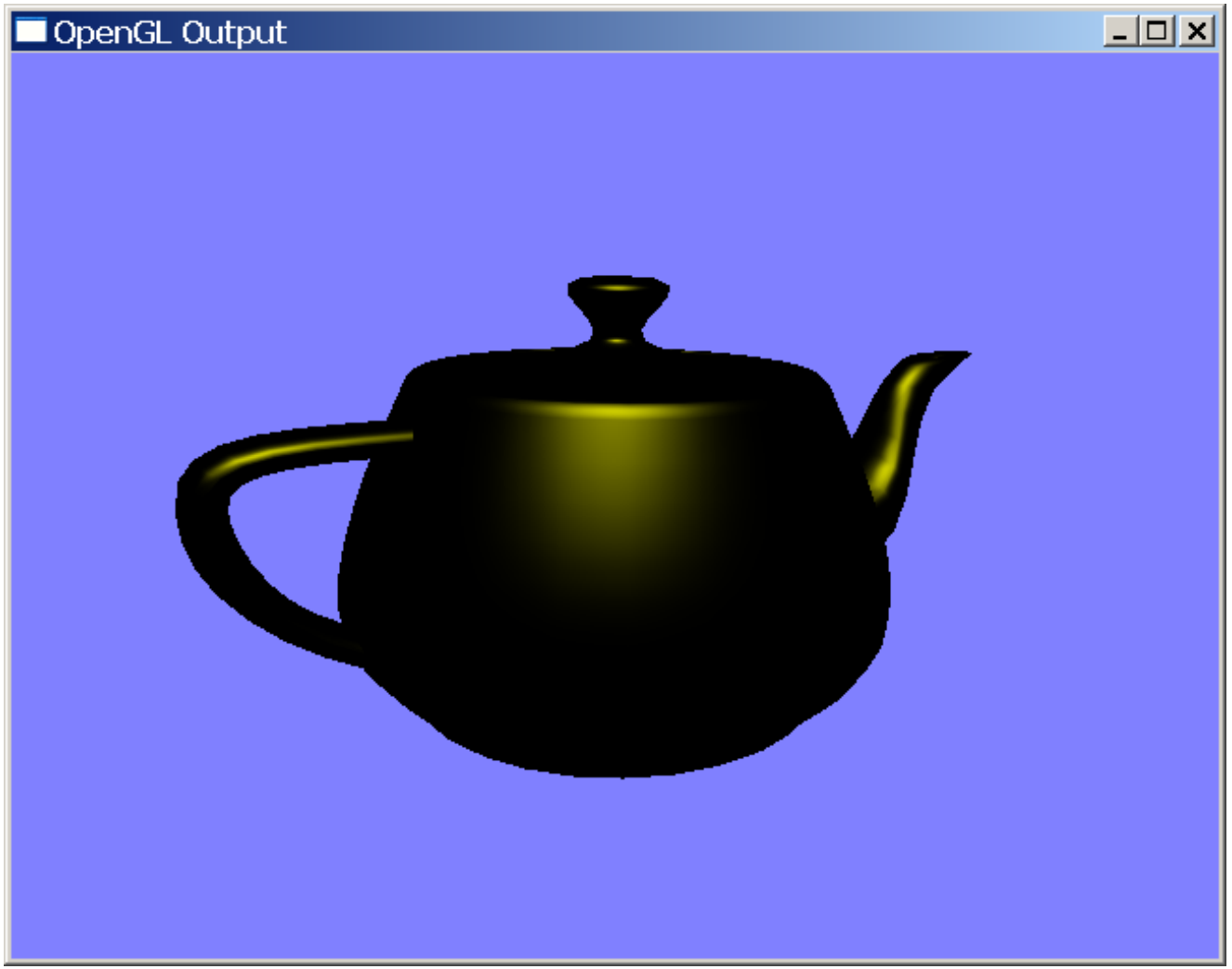
Ambient reflection



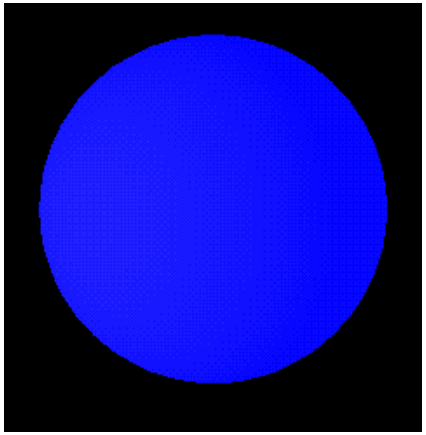
Diffuse reflection



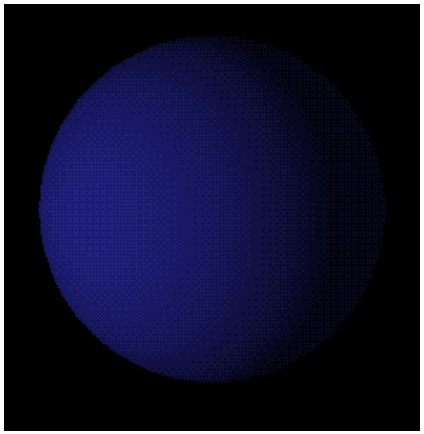
Specular reflection



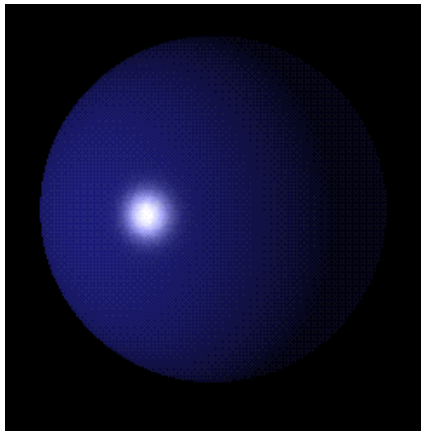
Combining Ambient, Diffuse, and Specular reflection



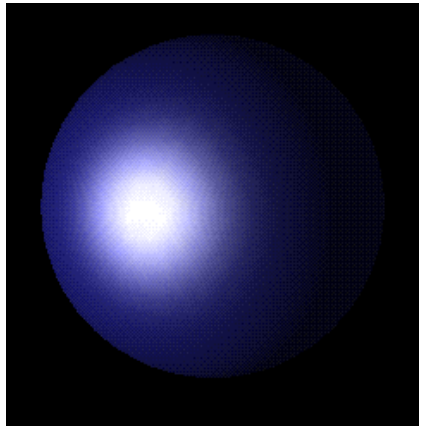
Ambient



Diffuse

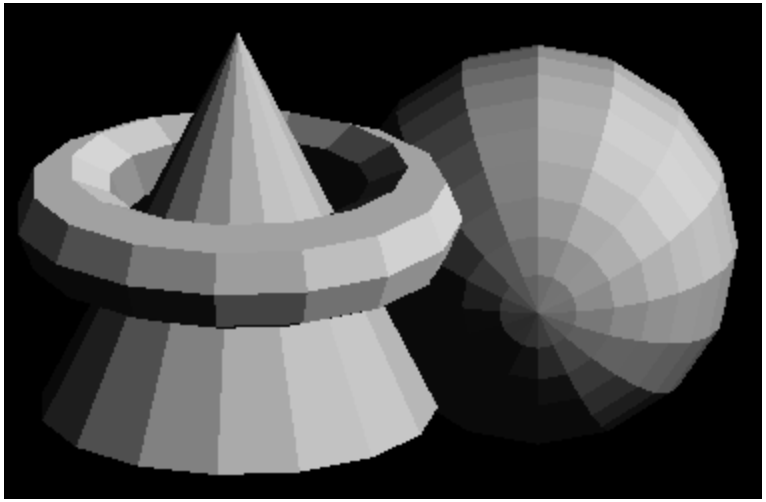


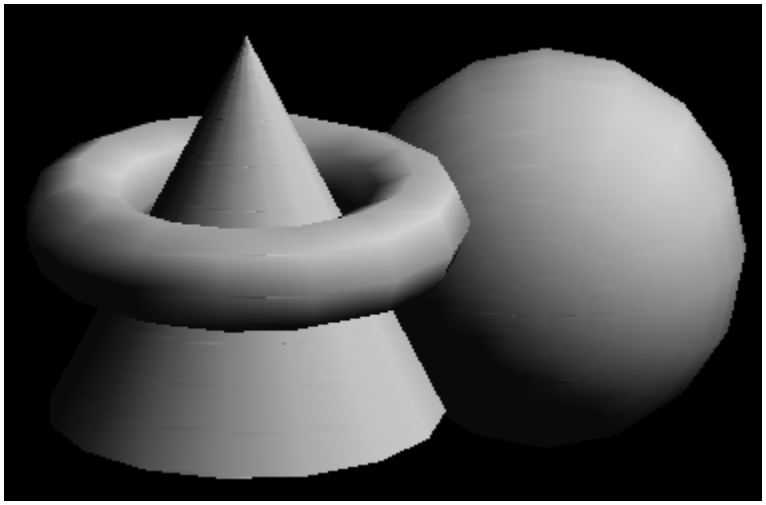
Specular



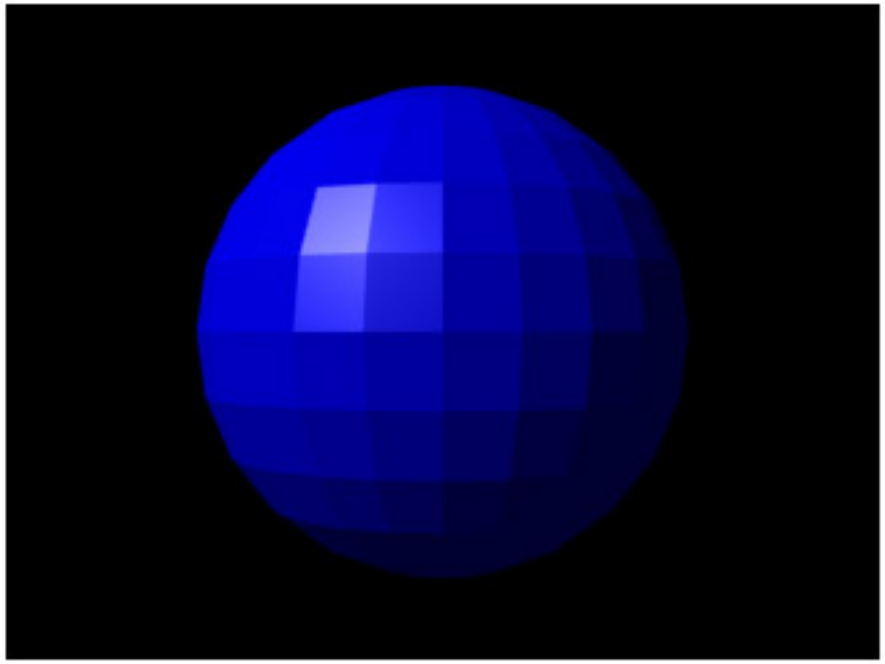
Combination

Flat shading vs. Smooth shading

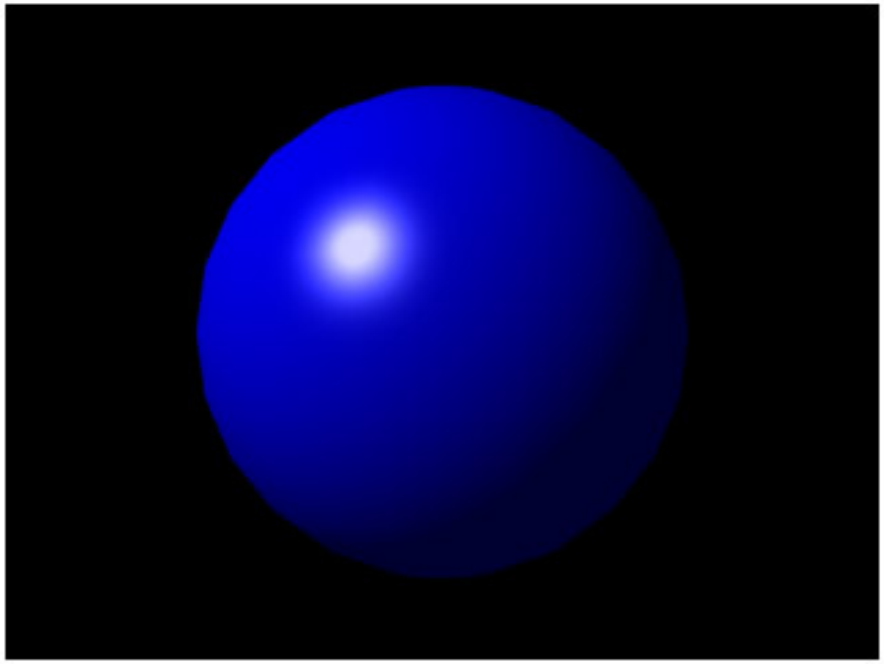




Phong Shading

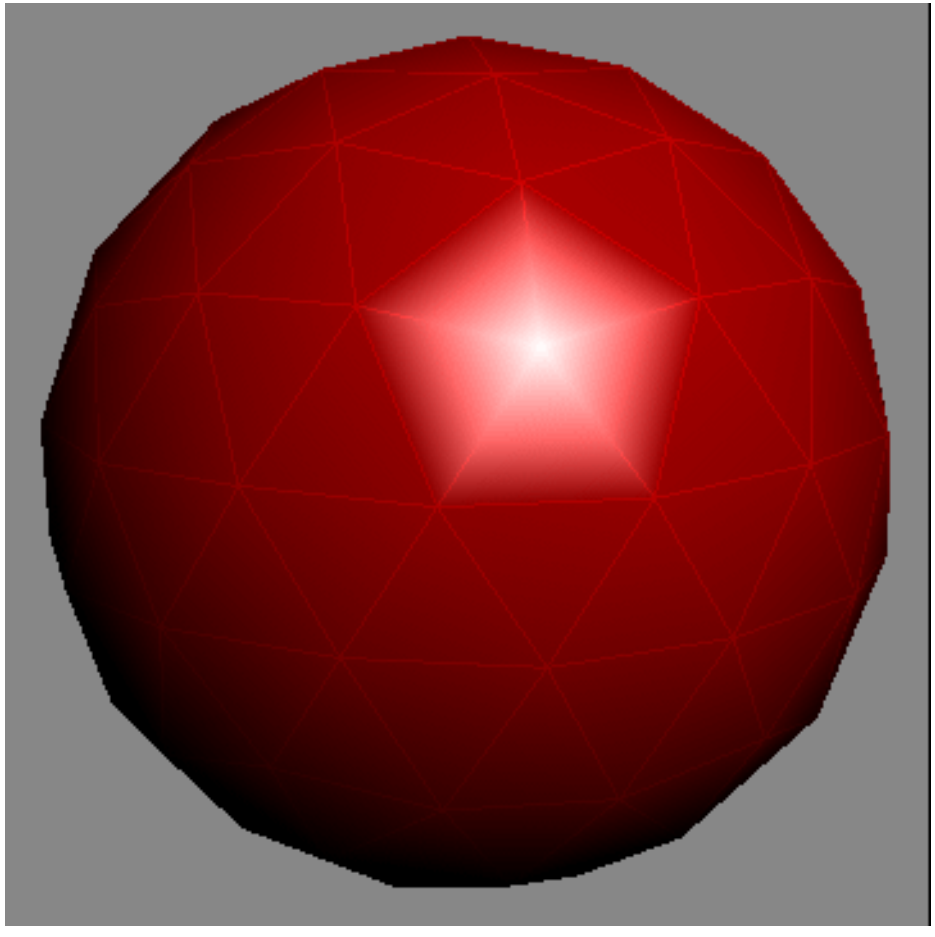


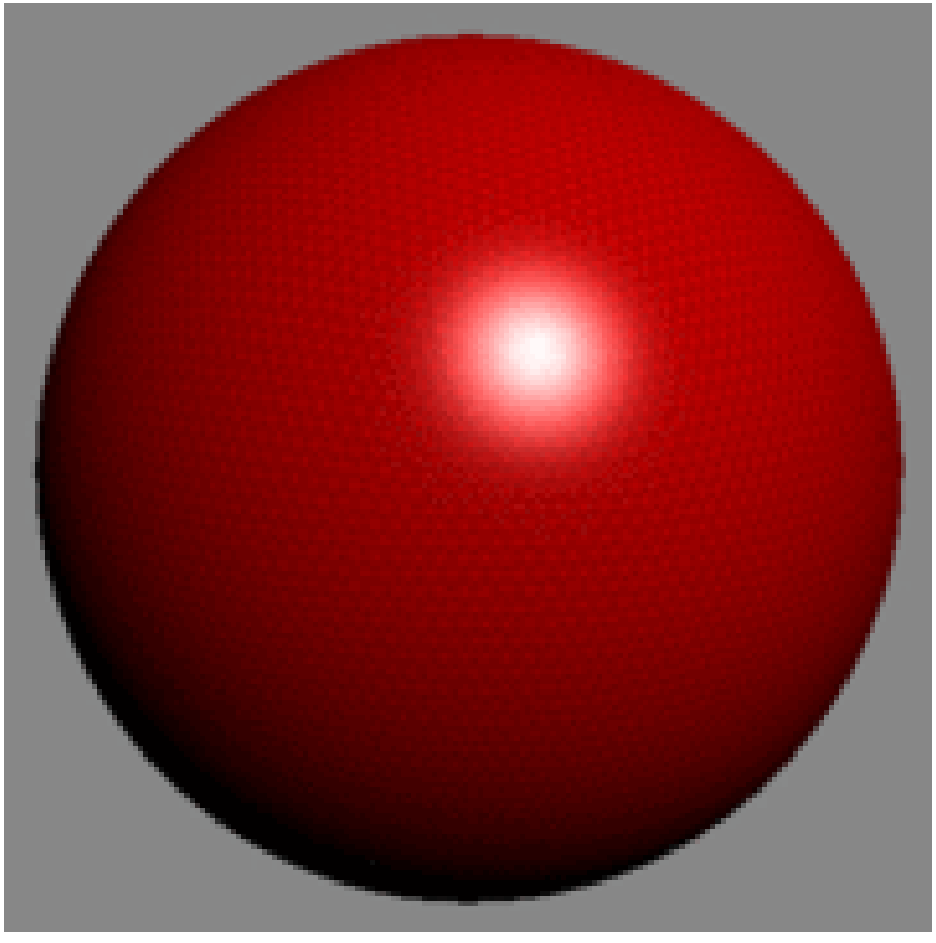
FLAT SHADING



PHONG SHADING

Gouraud Shading

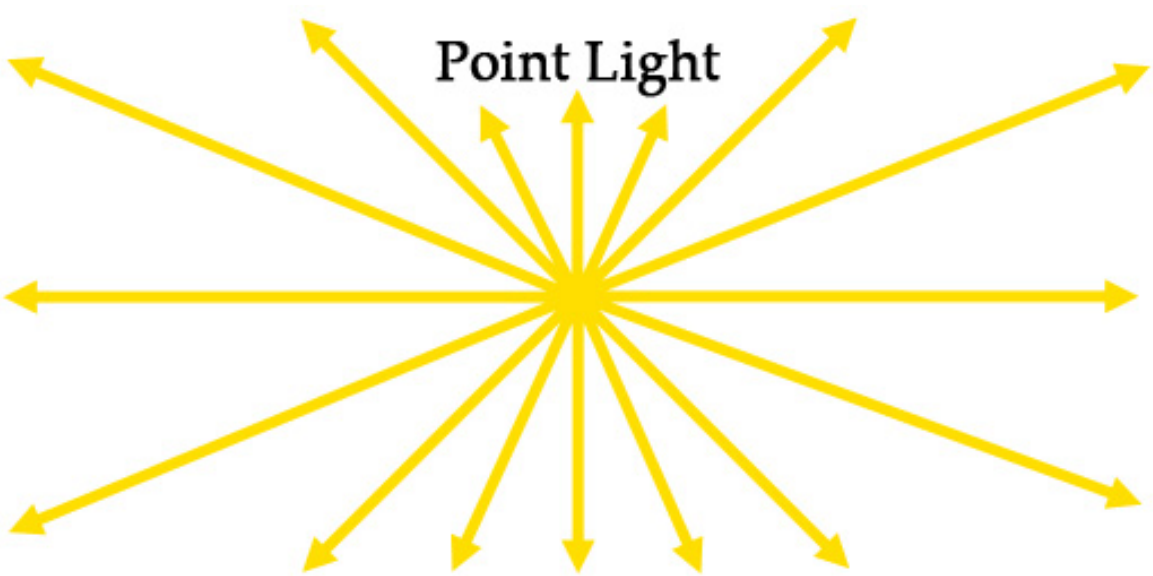




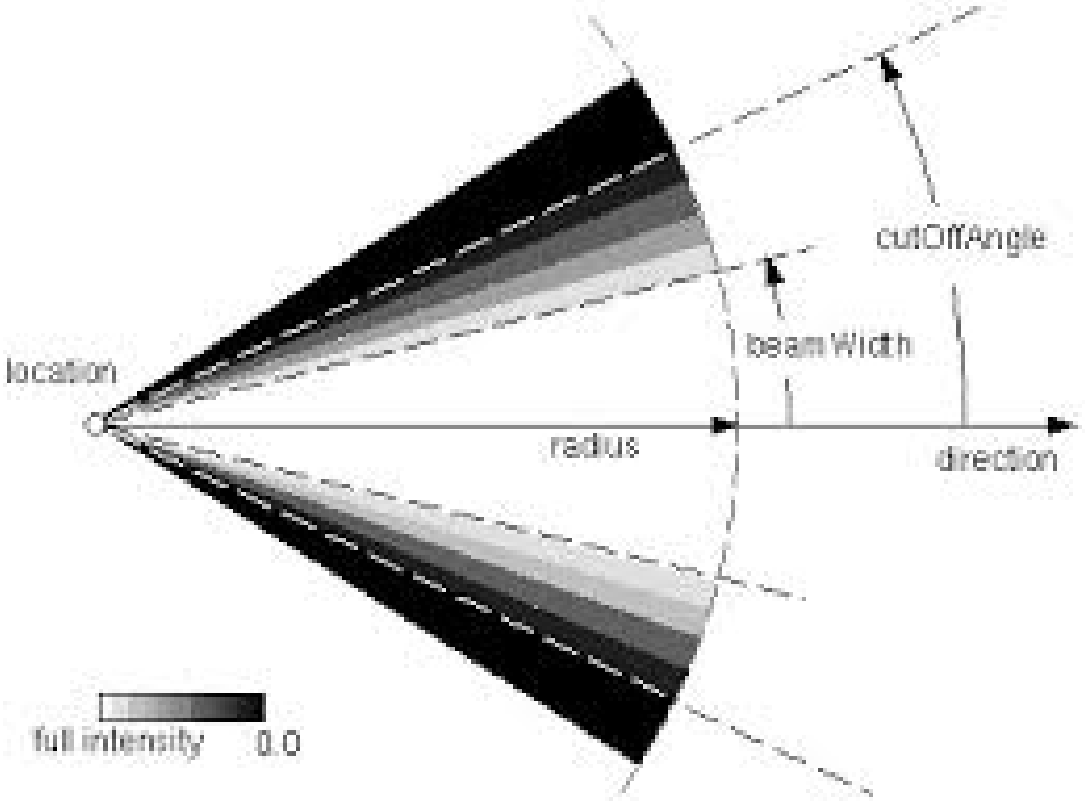
Sources of light

- Ambient light
- Point light
- Distance light
- Spotlight

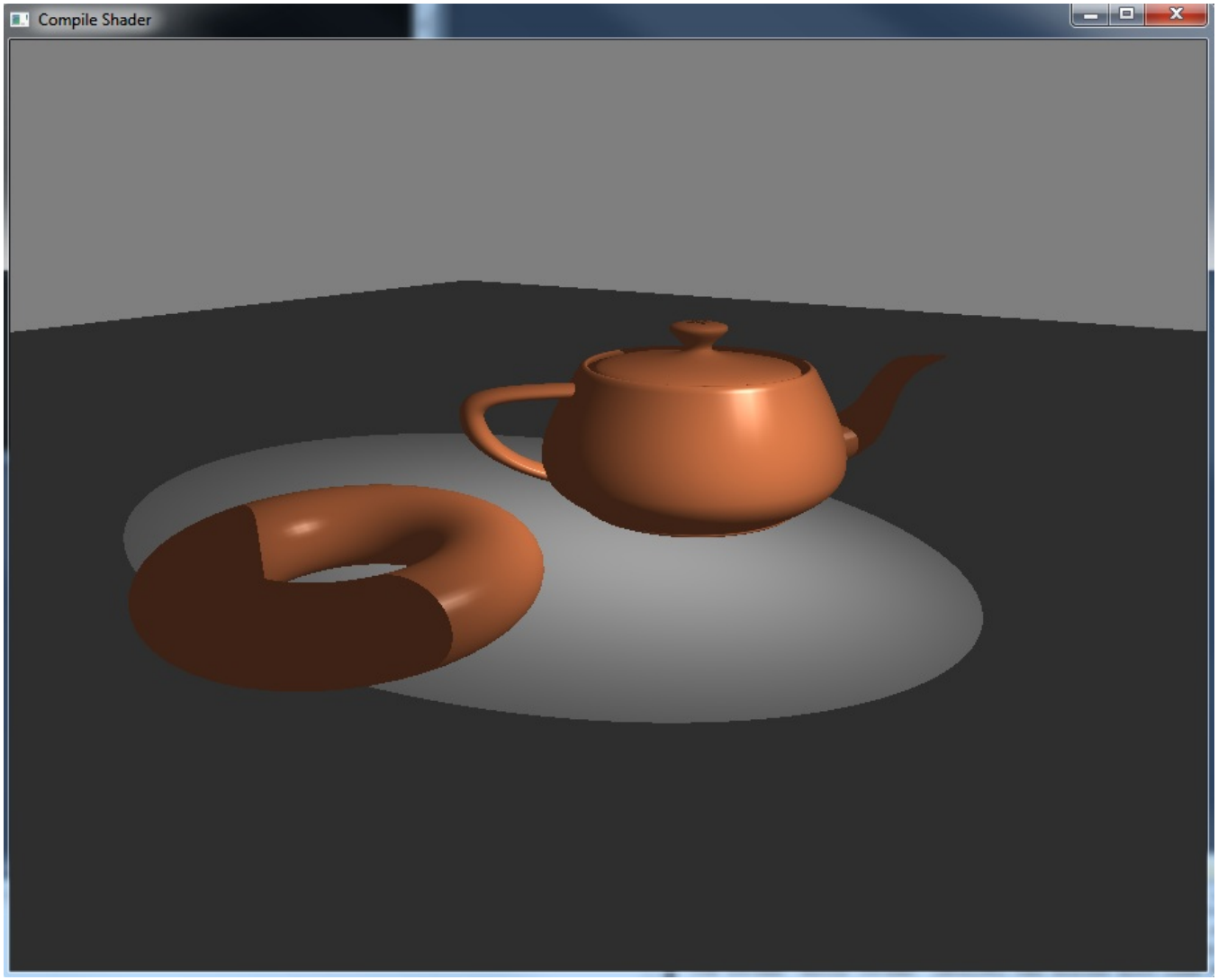
Point light



Spotlight

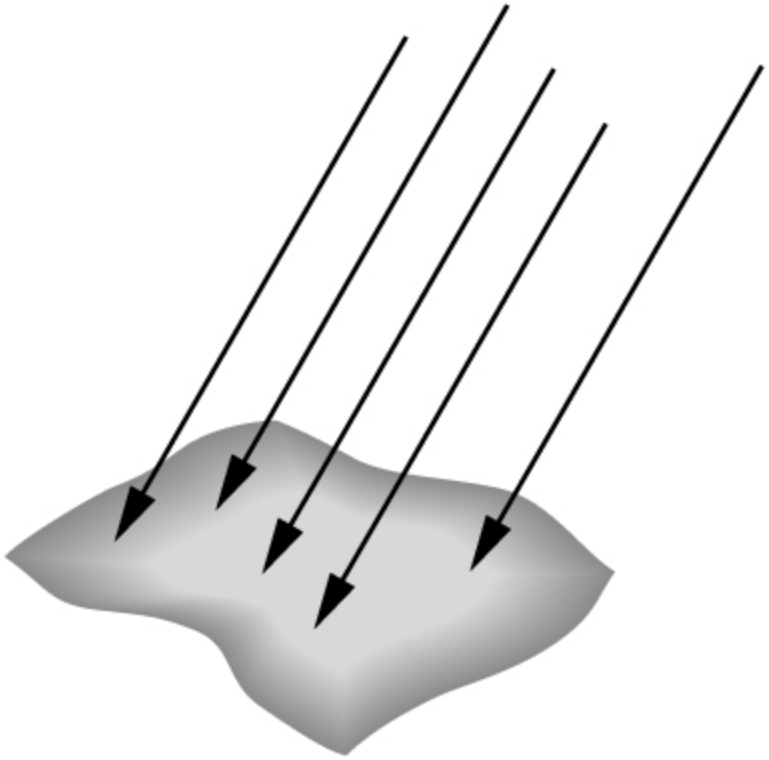

cutOffAngle
beamWidth
location
radius
direction
full intensity
0.0

Spotlight example



Distant light

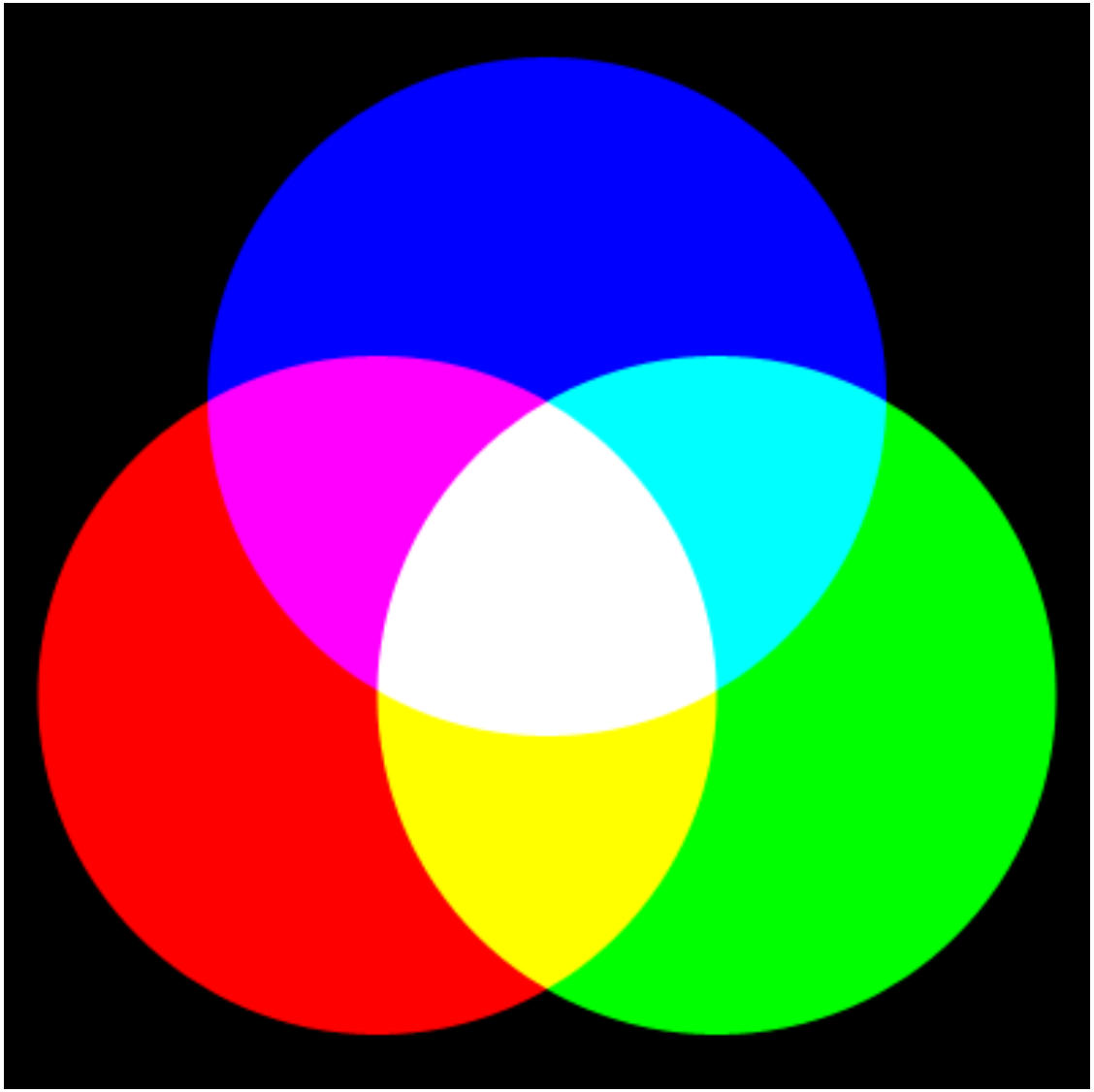
- Example: The Sun



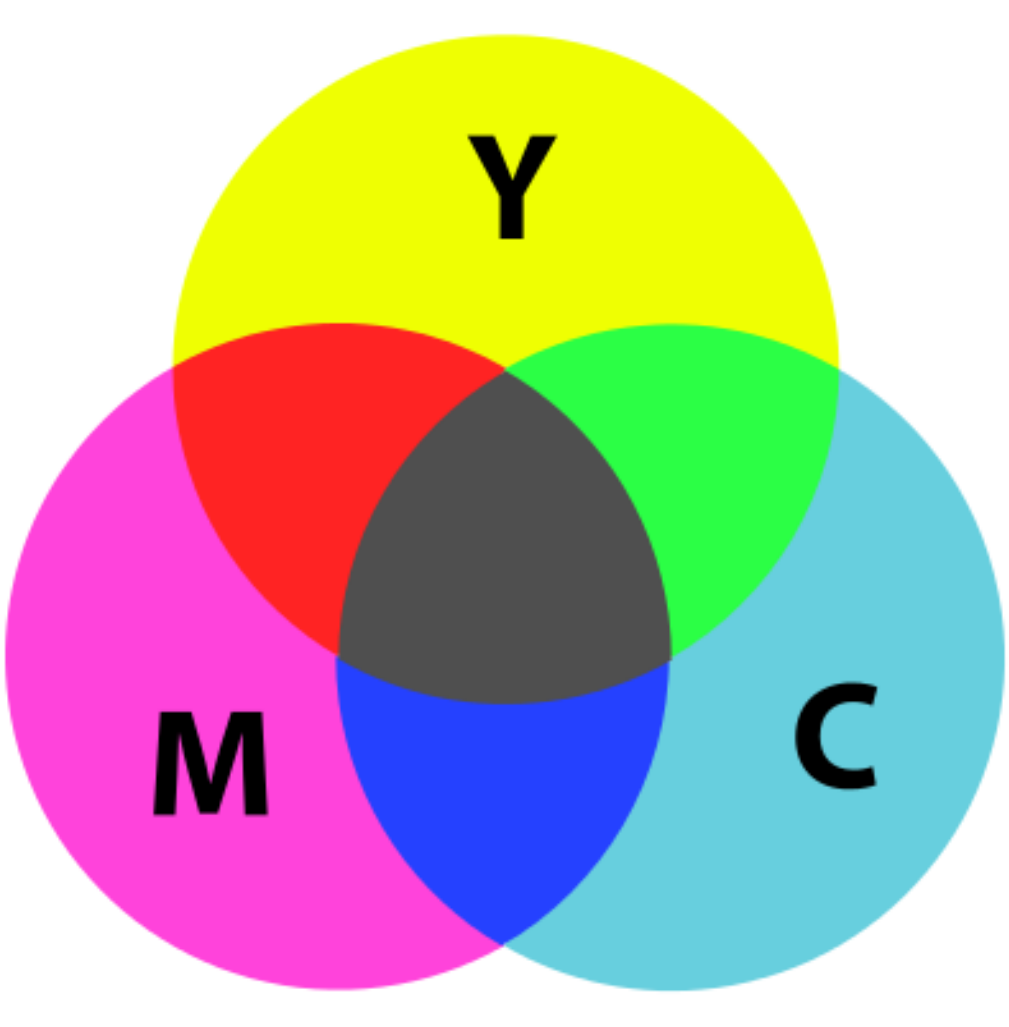
Color models and Color encoding schemes

- Color models:
  - RGB: Red, Green, Blue (an additive model)
  - CMY or CMYK: Cyan, Magenta, Yellow (a subtractive model). The K denotes black.
  - HSV: Hue, Saturation, Value
- Encoding schemes (broadcast video and television):
  - YIQ (used in NTSC broadcasting)
  - YUV (used in PAL broadcasting)

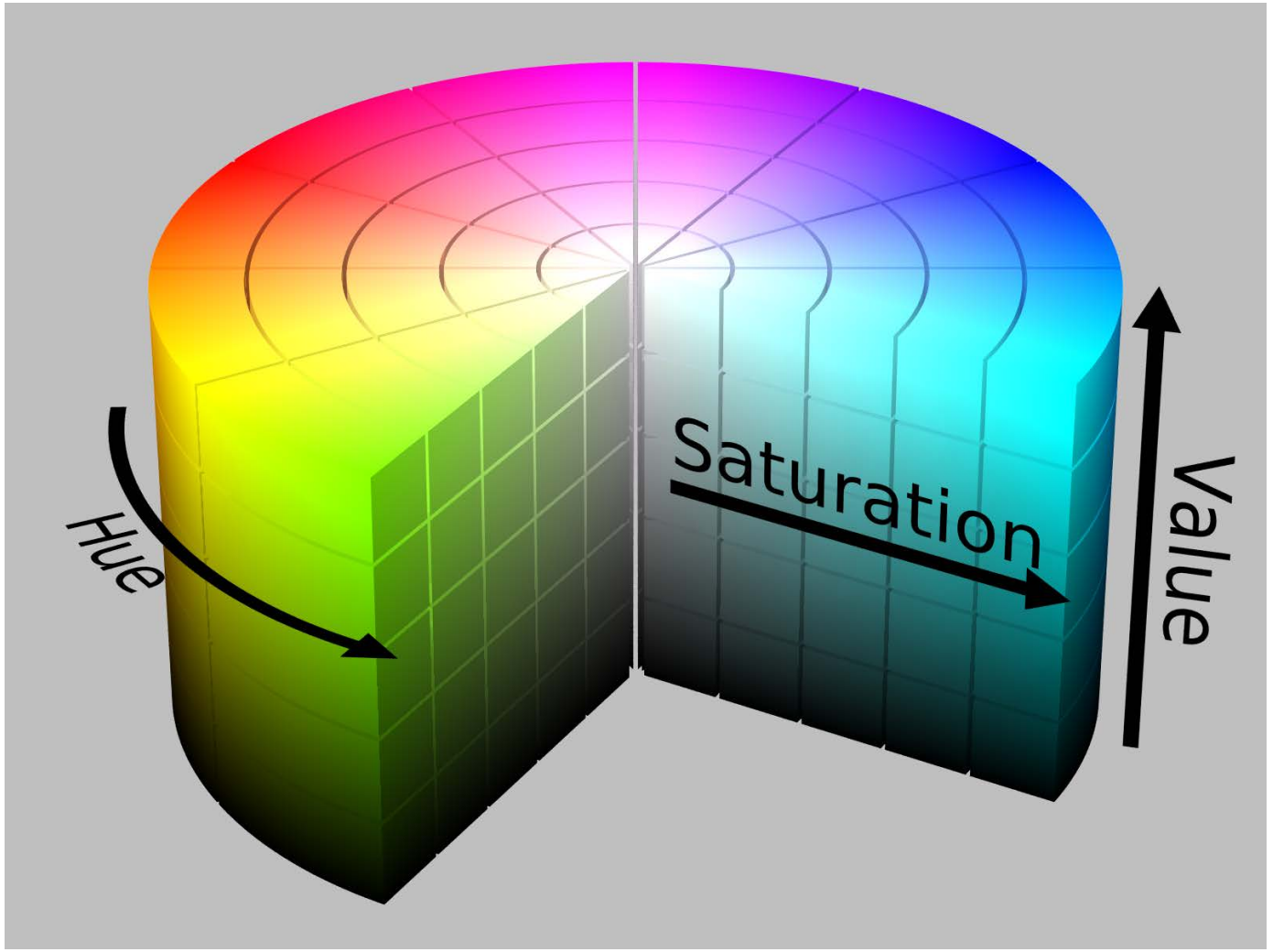
Additive colors: RGB



Subtractive colors: CMY



HSV colorspace



Next lecture…

- Surface opacity
  - Refraction in transparent materials
  - Light emission from materials (e.g. “glow”)
- Lighting effects
  - Bump maps
- Material properties
  - Texture maps
- Rendering
  - Ray tracing
  - Global illumination

Interesting link

The Joy of Visual Perception

http://www.yorku.ca/eye/toc.htm