

# **More Lighting**

**CSCI 4229/5229**

**Computer Graphics**

**Fall 2023**

# Blinn-Phong Light Calculations

$$\text{Light} = M_E + M_A C_A + (N \cdot L) M_D C_D + (N \cdot H)^s M_S C_S$$

- M material  
(ambient, diffuse, specular, emission)
- C light (ambient, diffuse, specular)
- N surface normal
- L light vector
- V eye vector
- $H = \frac{L+V}{\|L+V\|}$  normalized half angle
- s shininess

# Attenuation

$$att = \frac{1}{k_0 + k_1d + k_2d^2}$$

- $d$  distance from light to vertex
- $k_0$  constant attenuation factor
- $k_1$  linear attenuation factor
- $k_2$  quadratic attenuation factor

# Types of lights

- Positional Light  $(x,y,z)$
- Directional Light  $(x,y,z,0)$
- Spot Light (position, direction, cutoff)

