

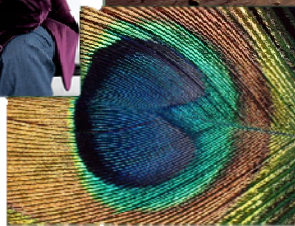
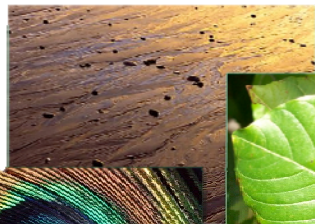
Lighting and Shading

Textbook Chapter 14
(some slides courtesy of Min Kim)

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Today: Modeling Material Appearance

- Rich variety of **materials**: characterized by surface reflectance and scattering



Announcements

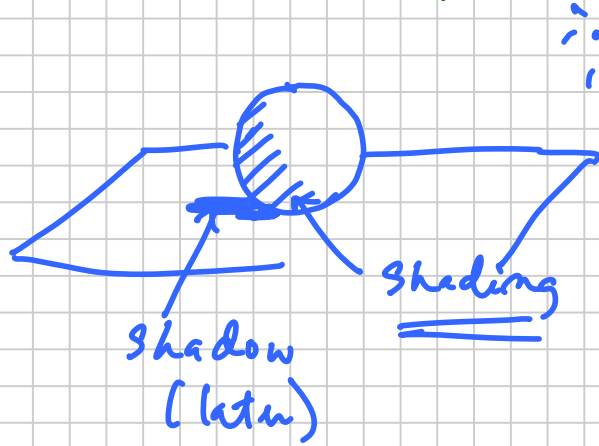
- Assignment 3 will be out before Wednesday, due March 9 (Sunday midnight)
- Assignment 2 spotlight on Wednesday

Shading & Lighting

Note Title

2014-02-24

Essential for perception of shape



Known to artists.

Current trends:

- physically based

rendering

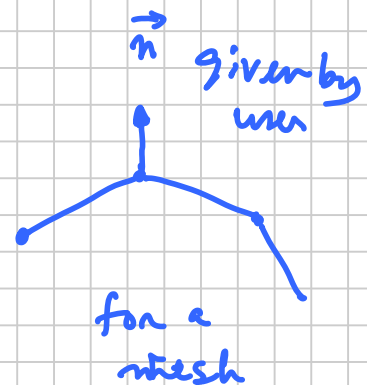
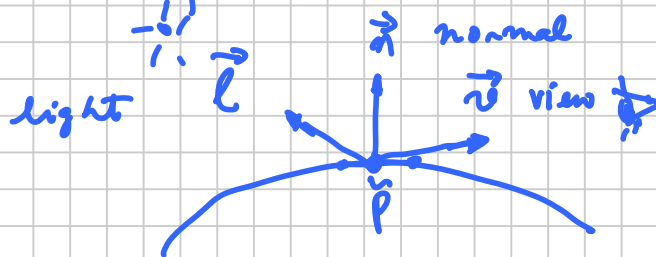
- painterly or

"NPR"

Non-photo realistic rendering

eg. "Toon shading"

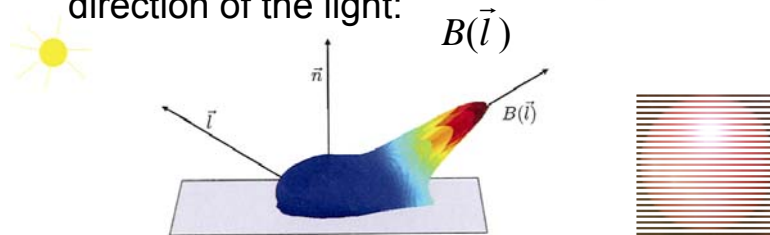
§ Basic definitions



[See PVC blob example]

Light blob from PVC plastic

- PVC blob
 - Note that this figure just describes the result of light that comes in from the specific shown direction \vec{l} . For other incoming directions we would need a different blob to visualize the resulting scattering.
 - The plastic will appear brightest when observed in the directions clustered about the 'bounce' direction of the light:

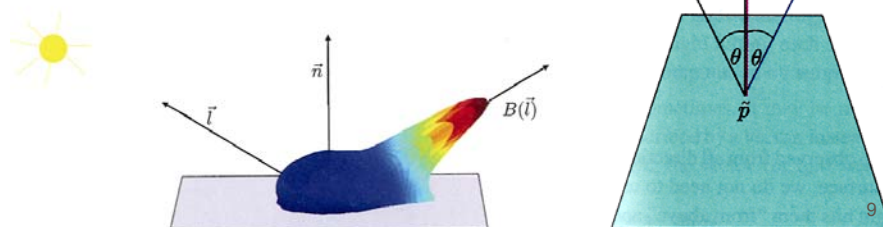


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Light blob from PVC plastic

- Recall: Given any vector \vec{w} (not necessarily of unit norm) and a unit normal vector \vec{n} , we can compute the bounce vector (mirror reflection) of \vec{w} as

$$B(\vec{w}) = 2(\vec{w} \cdot \vec{n})\vec{n} - \vec{w}$$



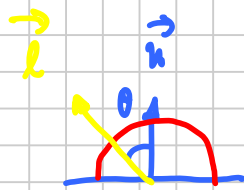
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§ A simplified model used in early Computer Graphics (still used in real time applications)

Phong Reflection Model

(Ambient + Diffuse + Specular)

like diffuse
but indep.
of \vec{l}



§ Diffuse: intensity is independent of \vec{v}
proportional to $\vec{n} \cdot \vec{l} = \cos \theta$

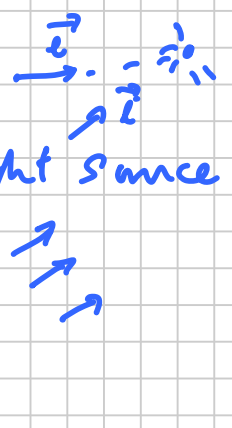
Actually $\max(0, \cos \theta)$

to avoid -ve light

Extensions: we defined point light source.

- directional light

- Spot light



§ For next class

Review Book 3.6

How Normals transform.