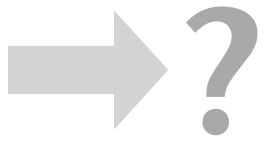
Wrap-up

CS465 Lecture 23

29 Aug	Introduction	Text Ch 1	slides | notes	
1 Sep	Images	Text Ch 3	slides | notes	
3 Sep	Perspective	Text Ch 4 (old 10) up to 4.3	slides | notes	
5 Sep	Perspective		slides | notes	hw1
8 Sep	Ray Tracing	Text Ch 4 (old 10) up to 4.8	slides | notes	
10 Sep	Ray Tracing		slides | notes	
12 Sep	Transformations	Text Ch 5, 6	slides | notes	hw2
15 Sep	Transformations		slides | notes	
16 Sep				Ray 1
17 Sep	Scene graphs		slides | notes	
19 Sep	Transformations		slides | notes	hw3
22 Sep	Viewing	Text Ch 7	slides | notes	
24 Sep	Viewing [demo]		slides | notes	
26 Sep	Pipeline | OpenGL [slides]	Text Ch 8 (new)	slides | notes	hw4
29 Sep	Pipeline		slides | notes	
1 Oct	Pipeline		slides | notes	
3 Oct	Midterm I			
6 Oct	Meshes	Text Ch 12 (old 13)	slides | notes	
8 Oct	Meshes		slides | notes	
10 Oct	Pipeline (contd.)		slides | notes	Model
13 Oct	Fall break			
15 Oct	Textures	Text Ch 10 (old 11)	slides | notes	
17 Oct	Sampling	Text Ch 9 (old 4)	slides | notes	hw5
20 Oct	PA3 Help Session		slides | notes	
22 Oct	Sampling		slides | notes	
24 Oct	Sampling		slides | notes	
27 Oct	Antialiasing | Compositing	Text Ch 3; [Porter & Duff 1984]	slides | notes	
28 Oct				Pipeline
29 Oct	Antialiasing | Texture sampling	[Williams 1983]	slides | notes	
31 Oct	Color	Text Ch 20; Draft of 3rd edition color chapter	slides | notes	
3 Nov	Color		slides | notes	
5 Nov	Color		slides | notes	
7 Nov	Ray Tracing 2	Text Sec. 10.8-10.9 (2nd ed)	slides | notes	hw6
10 Nov	Reflection and Shading		slides | notes	
12 Nov	Splines	Text Ch. 15 (2nd ed.)	slides | notes	
14 Nov	Midterm 2			
17 Nov	Splines		slides | notes	
19 Nov	Splines		slides | notes	
21 Nov	Surfaces		slides | notes	
24 Nov	Surfaces		slides | notes	
25 Nov				Ray 2
26 Nov	Thanksgiving			
28 Nov	Thanksgiving			
1 Dec	Animation		slides | notes	
3 Dec	User-centered Design		slides | notes	



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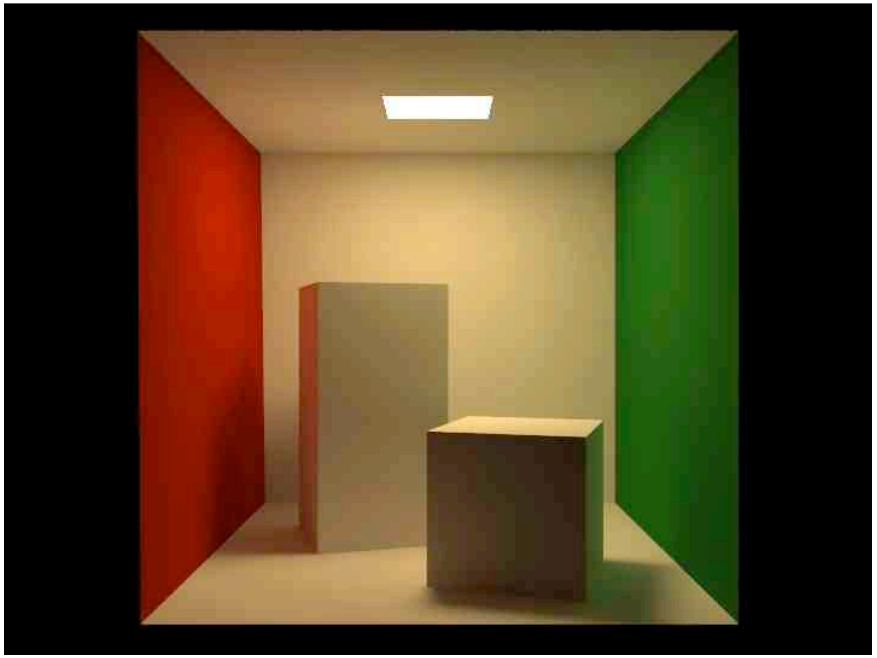
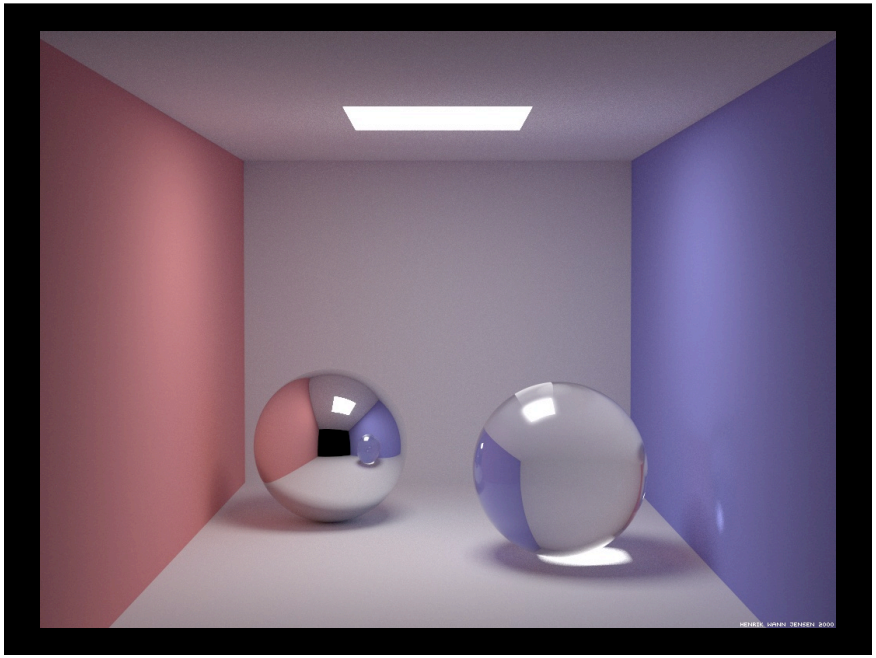
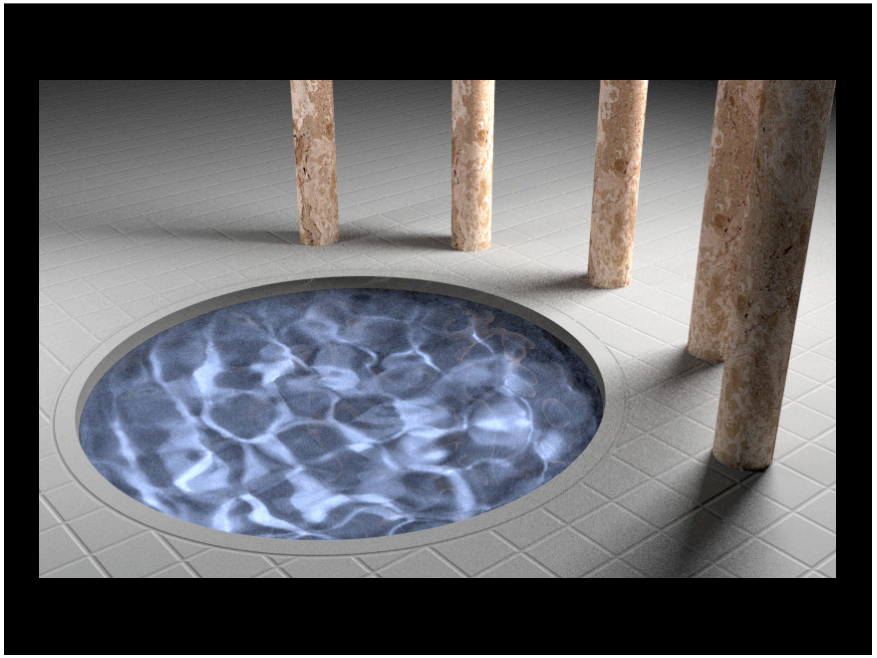





Henrik Wann Jensen
RENDERED USING DALI - HENRIK WANN JENSEN 2000



Surface materials

metal

dichromatic materials

Fabric

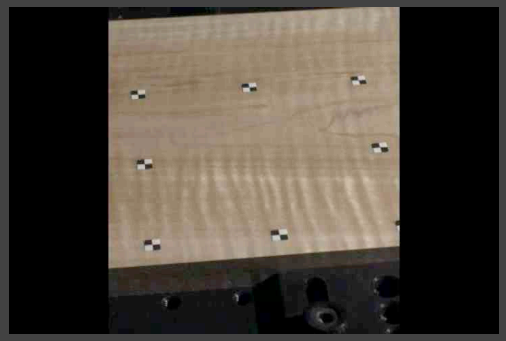
Wood

Paper

Skin

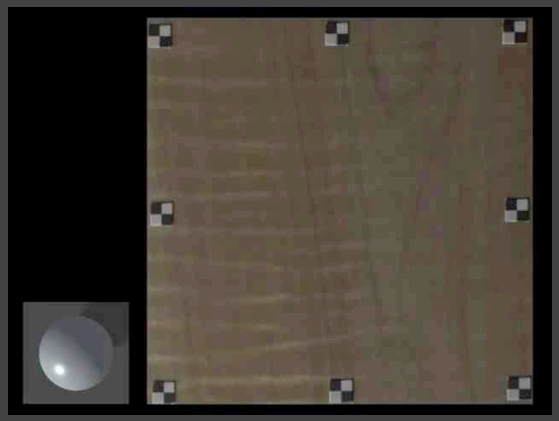
Granular materials

Hair

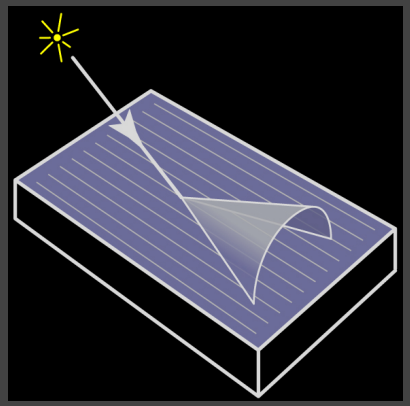


What causes the distinctive "depth" of finished wood?

Measurement data: maple

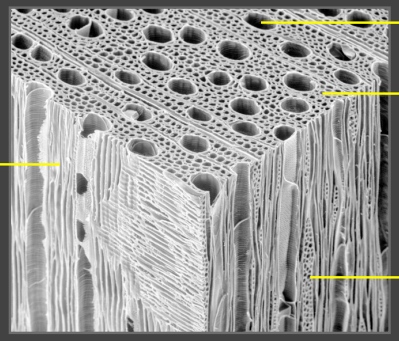


Anisotropic reflection



Specular reflection emerges in a half-cone

Wood structure

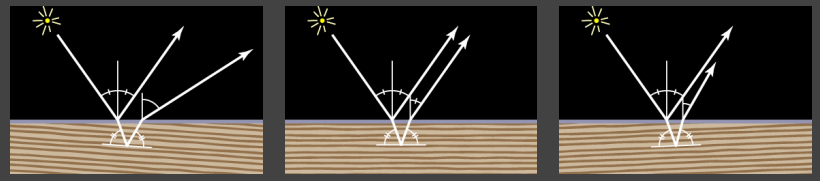


composition: cellulose and related compounds

N.C. Brown Ctr. Ultrastructure Studies, Syracuse Univ.

Optically: parallel air tubes in dielectric

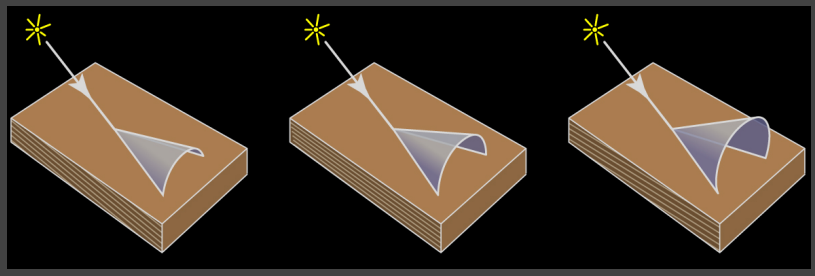
Wood reflectance



sloping down parallel sloping up

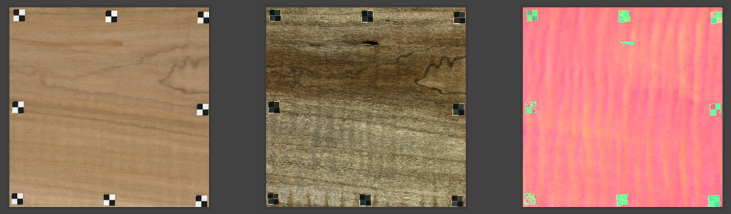
Subsurface specular reflection is off-angle

Wood reflectance

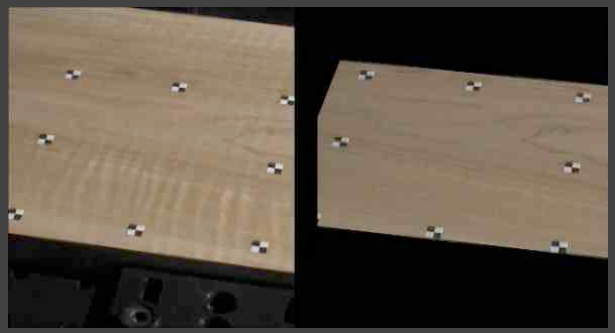


sloping down parallel sloping up

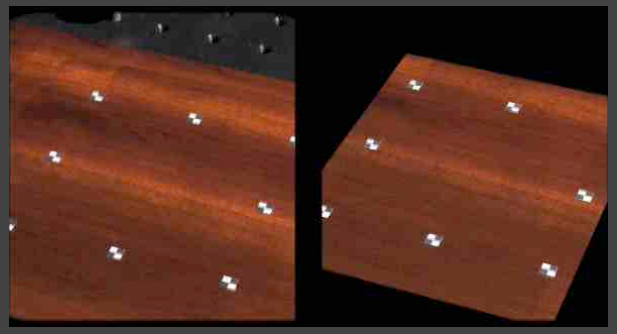
Wood's BRDF depends on the fiber slope



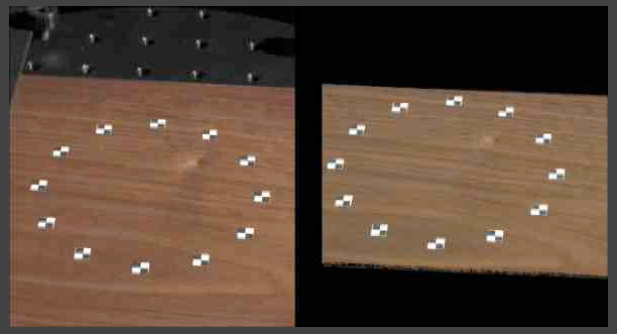
diffuse color fiber color fiber direction



video rendering



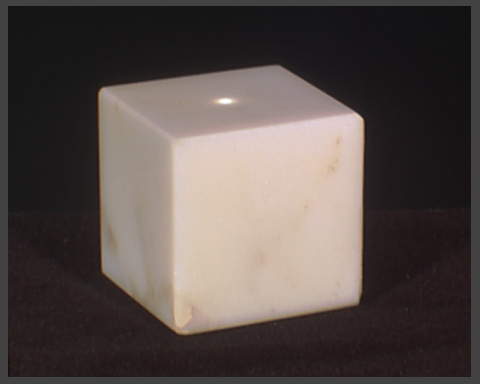
video rendering



video rendering

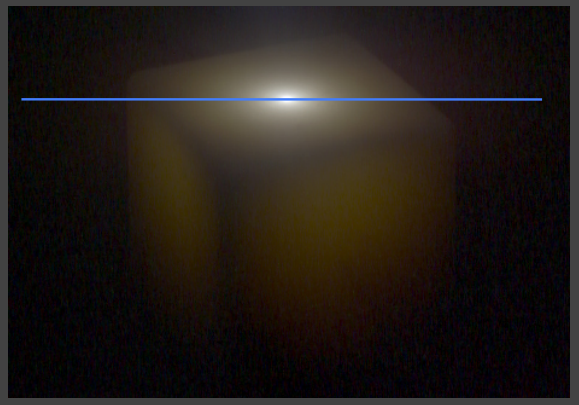
Why do these look wrong?

Marble sample

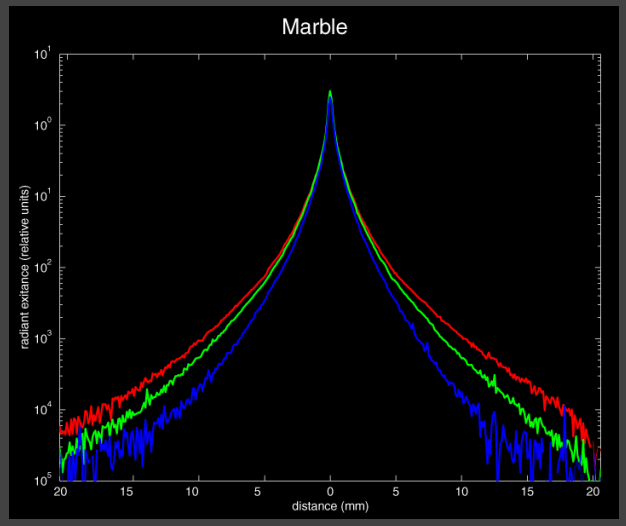


40mm cube of statuary marble

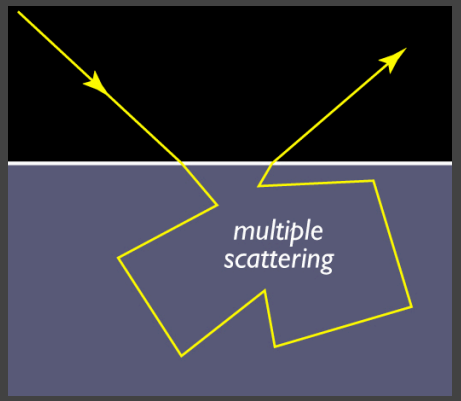
HDR photograph



(log scaled image)

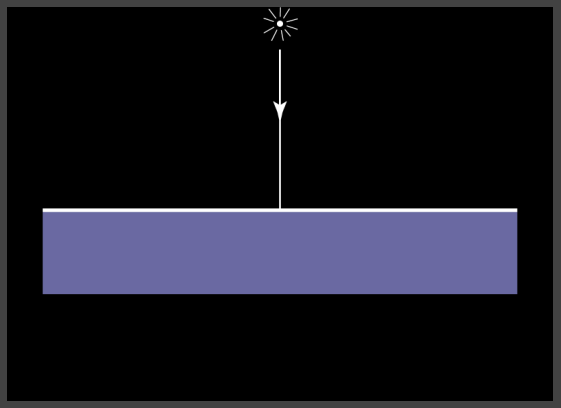


Subsurface volume scattering

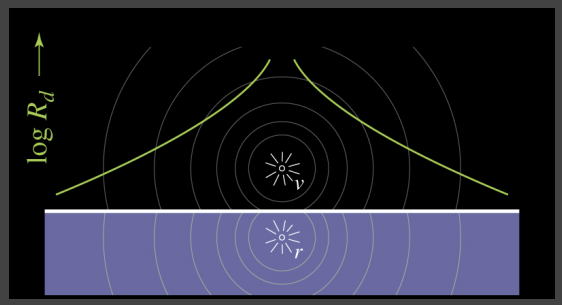


Light diffusion

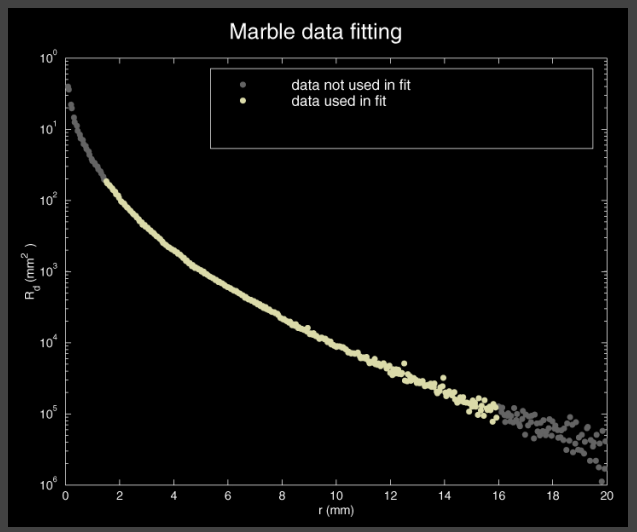
Diffusion approximation

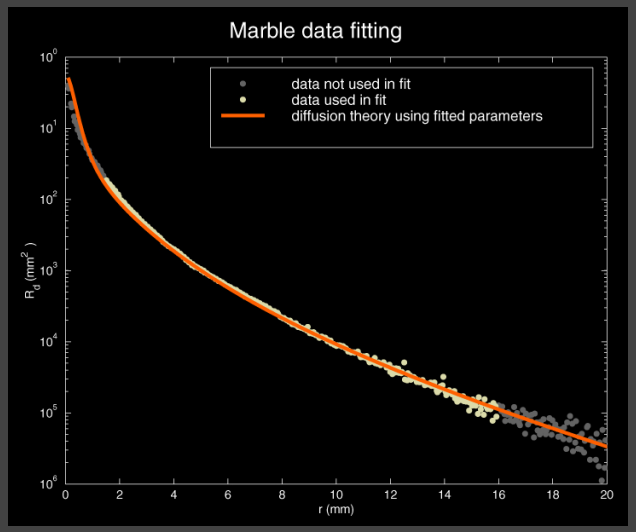


Diffusion approximation



Marble data fitting





Results: milk

Diffuse "milk" Skim milk Whole milk

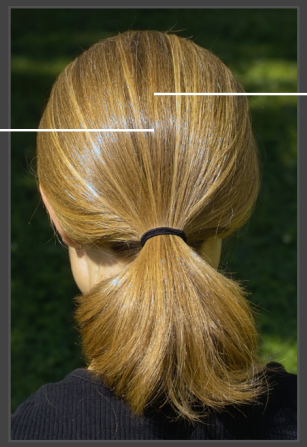
Results: skin

opaque skin

translucent skin

The Two Towers (2002)

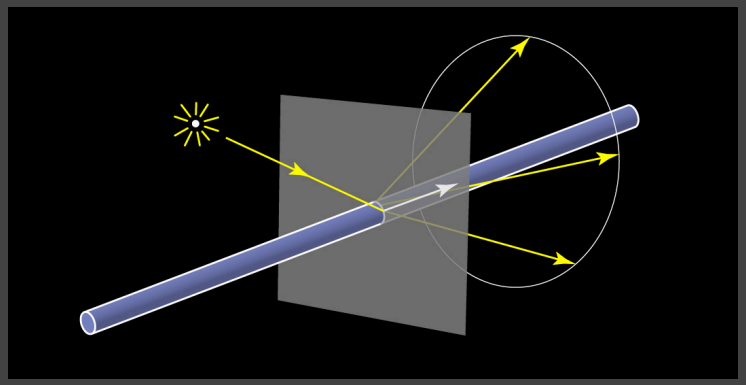
Hair appearance



Hair appearance

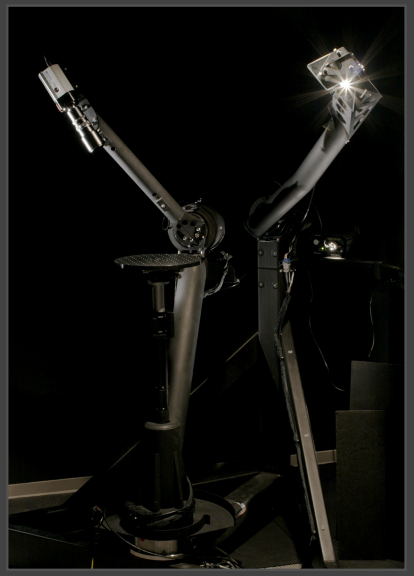
Hair appearance

Classic hair reflection model



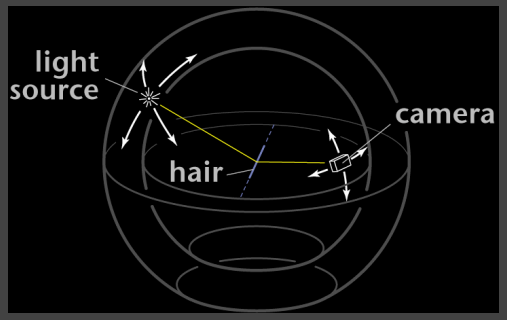
predicts a single, white highlight

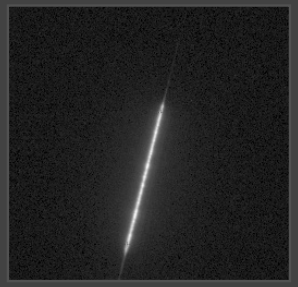
Measurement



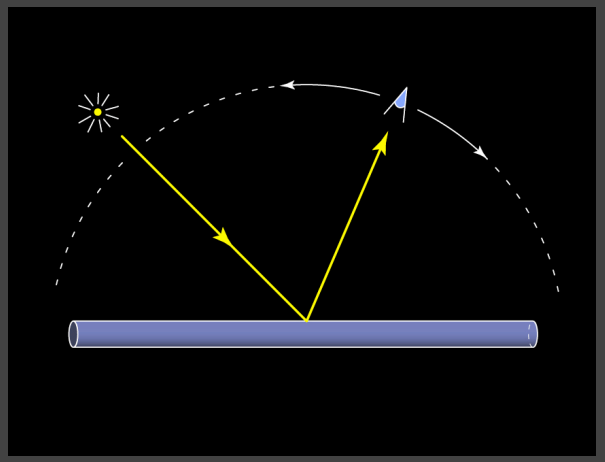
Cornell Spherical Gantry

Measurement

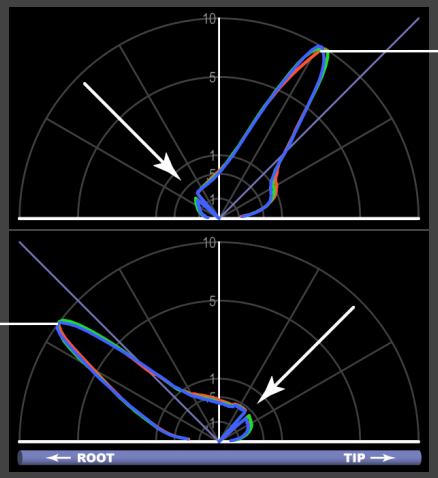




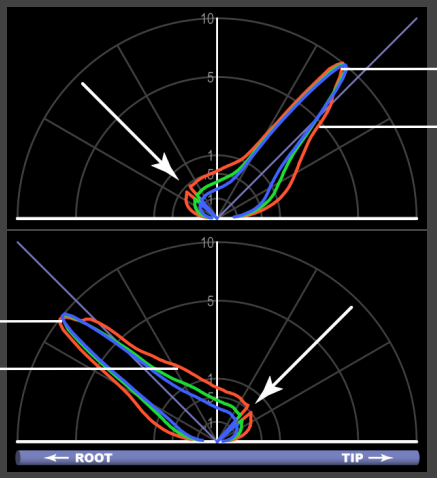
Measurement—longitudinal



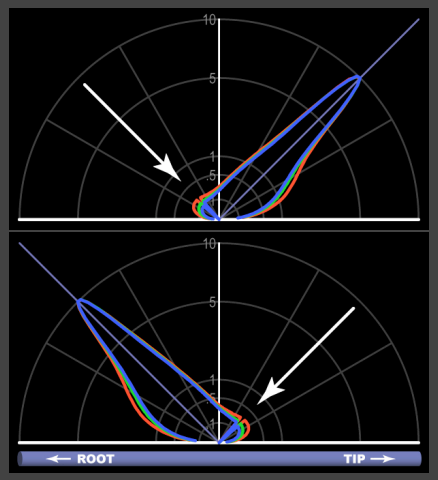
Black hair



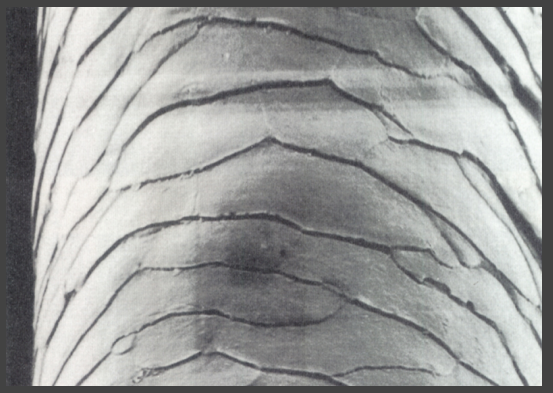
Blond hair



Synthetic hair

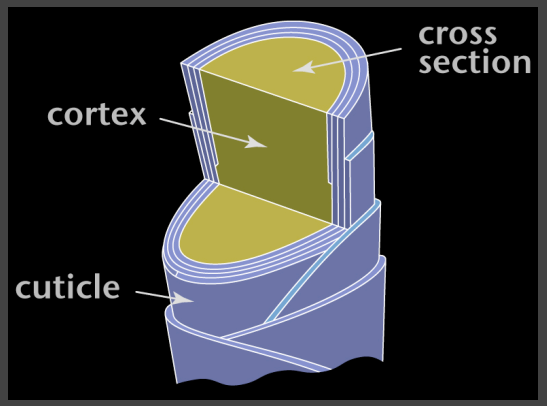


Hair structure



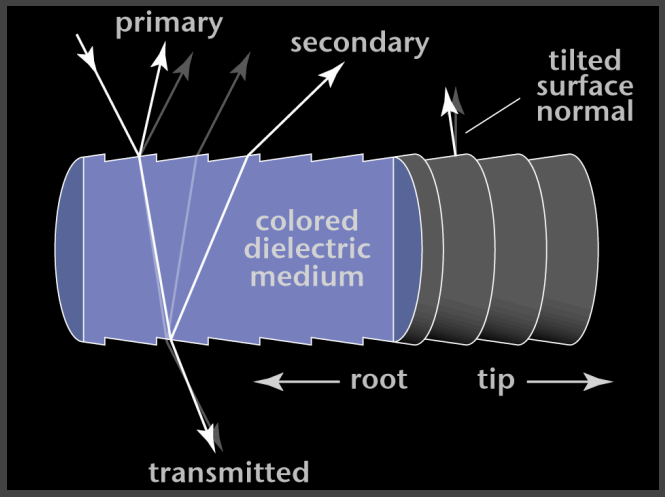
[Robbins 1994]

Hair structure

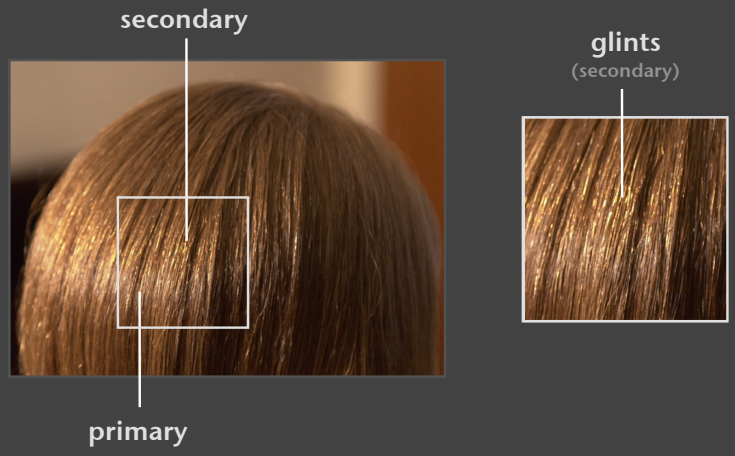


(after [Robbins 1994])

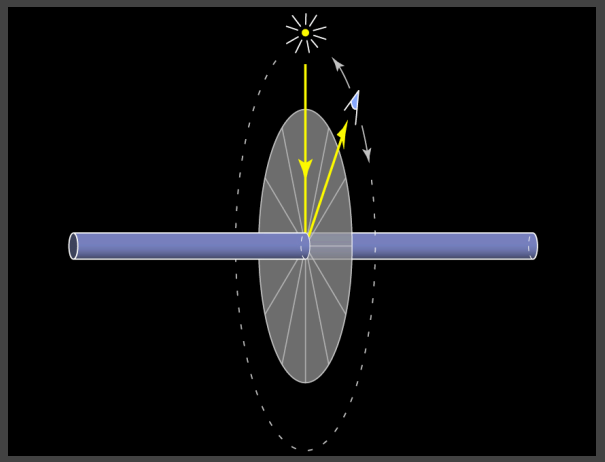
Fiber reflection—longitudinal



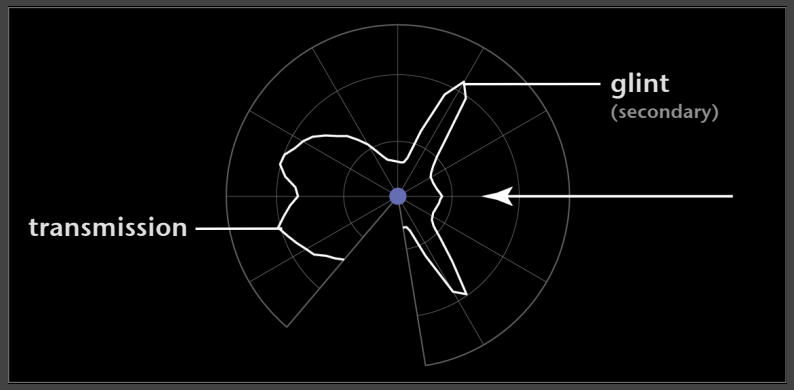
Hair appearance

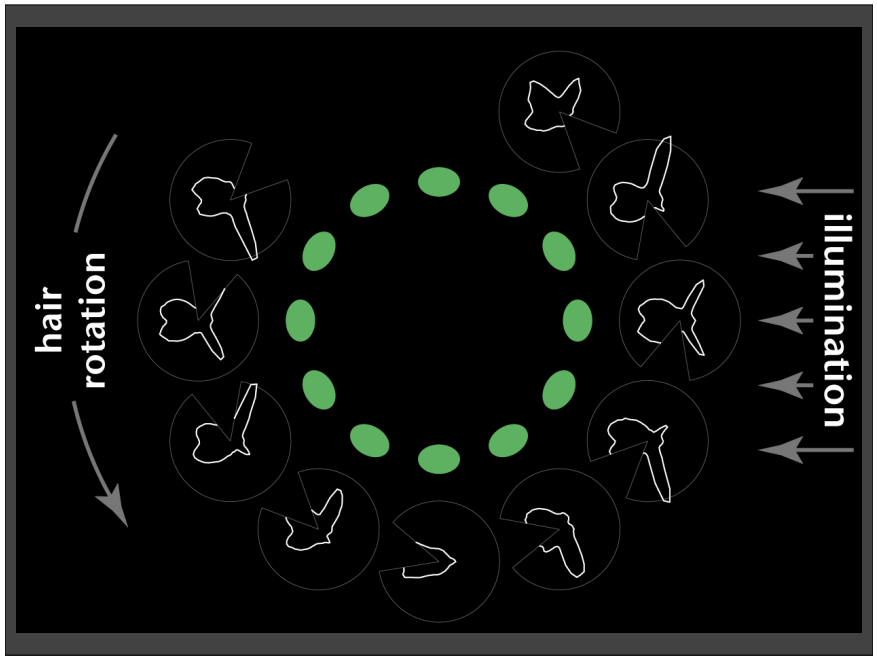


Measurement—cross section

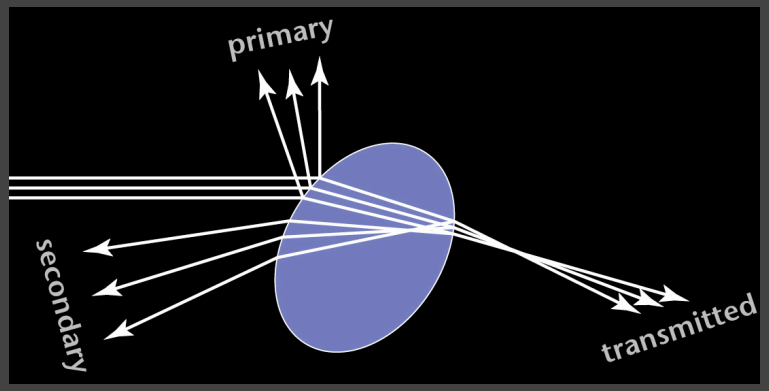


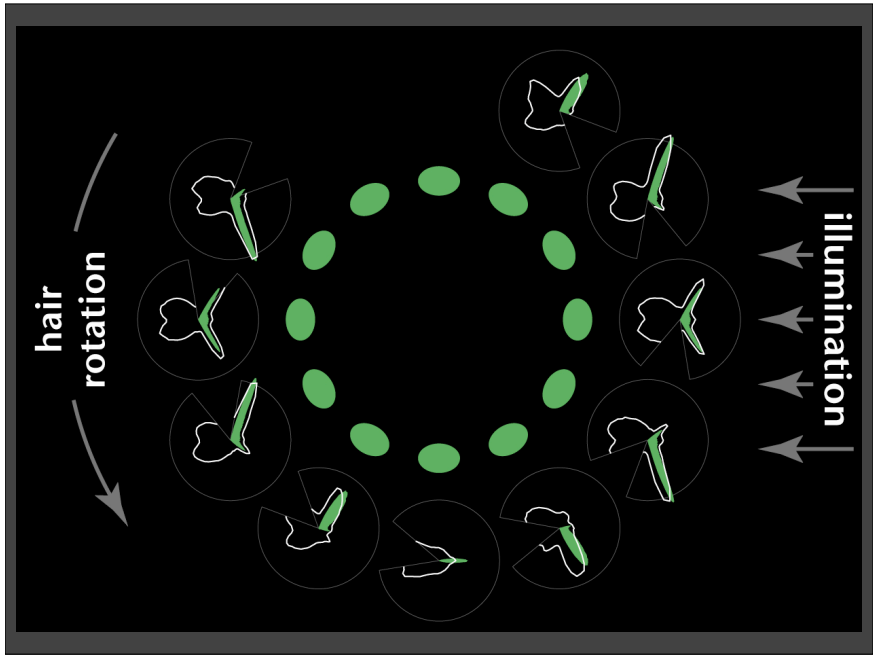
Blond hair





Fiber reflection—cross section





King Kong (2005)