









### **Material Samples**





translucent

#### **Material Samples**



complex surface structure



#### How to describe materials?

- mechanical, chemical, electric properties
- reflection properties
- surface roughness
- geometry/meso-structure
- relightable representation of appearance













#### **Representing Appearance**

Spatially-Varying BRDF







# **Representing Appearance**









## **Material Acquisition**

• spatially-varying BRDF + geometry model

- moving highlights



#### **Acquisition Approaches**

- hard to sample an 8D function
- dimensionality reduction
- sampling density
- restricted viewing and relighting capabilities
- restriction to a specific class of materials/objects



Comparison						
			View Res.		Light Res.	
Technique	Acquisition	#Images	spatial	dir.	spatial	dir.
texture maps	diffuse illum.	10-20	hi	-	-	-
light fields	fixed illum.	100-500	hi	med	-	-
image-based BRDF	point light	20-60	hi	hi	hi	hi
SBRDFs	point light	10-40	hi	hi	hi	hi
reflectance fields/BTFs	point light	500-10000	hi	med	-	med
relighting with 4D incident LFs	projector	50000- 100000	hi	-	med	lo
environment mattes	monitor	1-1200	hi	-	-	hi
opacity hulls	point light + monitor	20000- 60000	hi	med	-	hi
translucent	laser beam	500000- 1000000	hi	-	hi	•