

Kaj je svetloba?

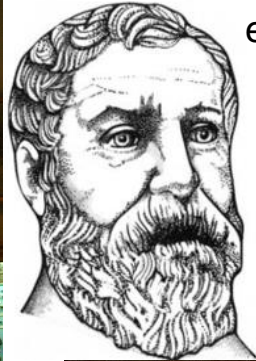
▶ Euclid (300 BC)

Zakaj so oddaljeni objekti manjši?



▶ Hero of Alexandria

Svetloba vedno potuje naravnost znotraj enega medija



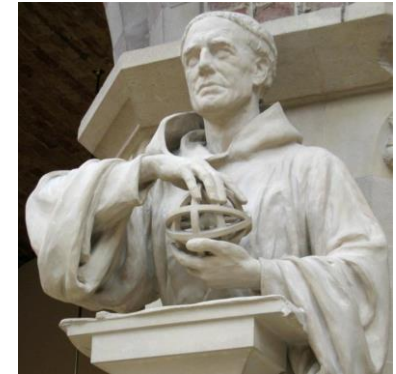
▶ Alhazen (1000 AD)

Svetloba je kot žoga

- Odboj
- Lom



▶ Roger Bacon (1250 AD)



Povečevalno steklo

- mavrica

▶ Rene Descartes

„Bog je najboljši urar“

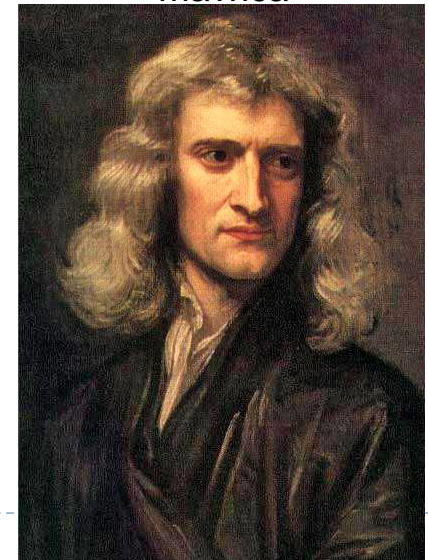
- Oko = leča (fokus)
- Razlaga mavrice



▶ Isaac Newton

„Bog je matematik“

- Bela svetloba je umazana
- Temelj znanstvene metode



Optične lastnosti lic

- ▶ **absorbirajoče** (absorberji)
- ▶ **oddajajoče** (svetlobni viri, luči, svetila, *lights*)

- ▶ motne oz. **hrapave** (*dull, matt*) ploskve
- ▶ bleščeče oz. **gladke** (*shiny*) ploskve

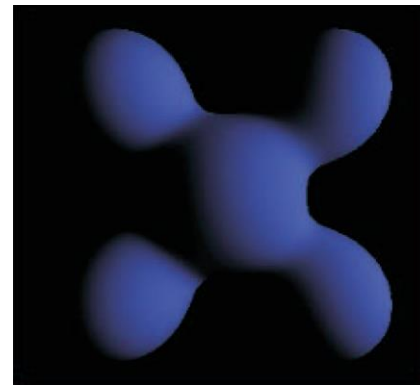
- ▶ **prozorne** (*transparent*)
 - ▶ delno prozorne oz. **prosojne** (*translucent, semitransparent*)
- ▶ **odbojne** (zrcala)

Lastnosti lic (odboj svetlobe)

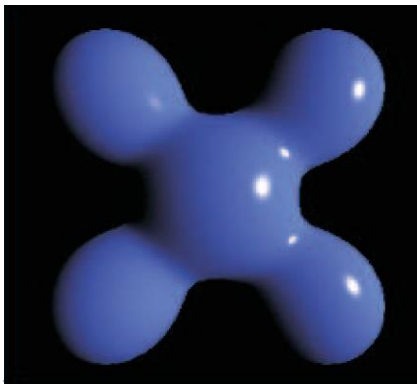
- ▶ Ambientalna svetloba



- ▶ Razpršeni odboj (na hrapavi ploskvi)



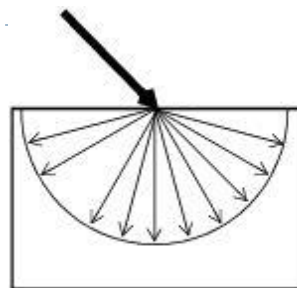
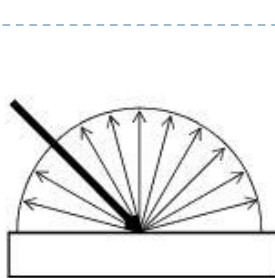
- ▶ Bleščeč odboj



Lastnosti lic

- ▶ Difuzni odboj
(razpršena svetloba)

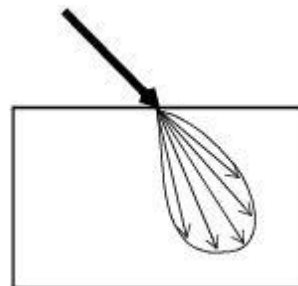
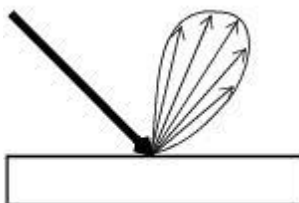
- ▶ Lambertov kosinusni zakon



- ▶ difuzni lom

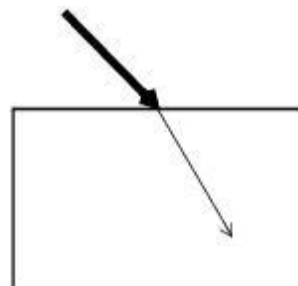
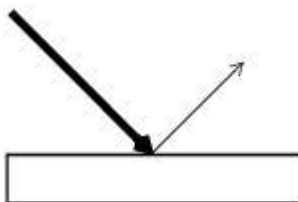
- ▶ Bleščeči (specular)
odboj

- ▶ Intenziteta odvisna od kota opazovalca



- ▶ bleščeči lom

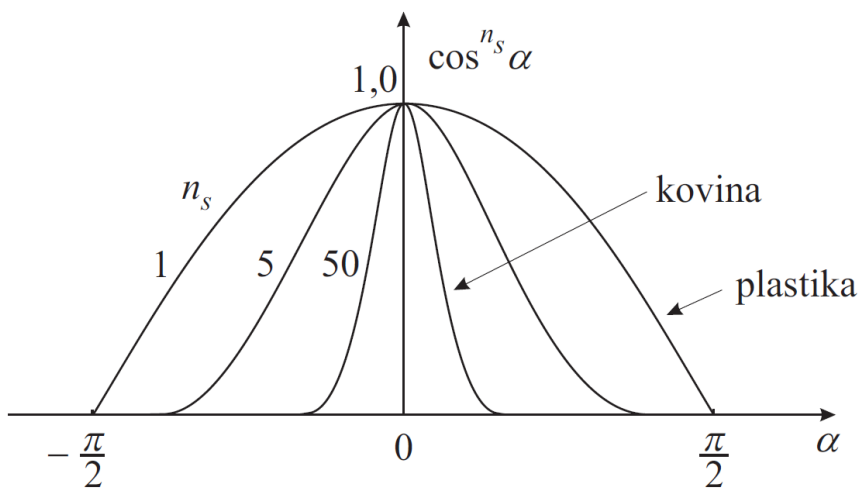
- ▶ Zrcalni (reflection)
odboj



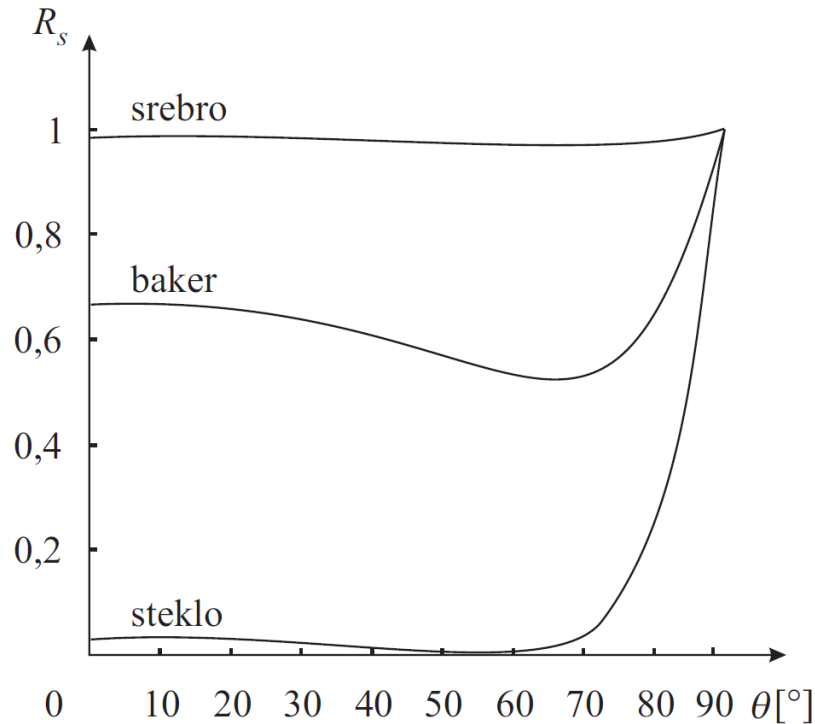
- ▶ zrcalni lom

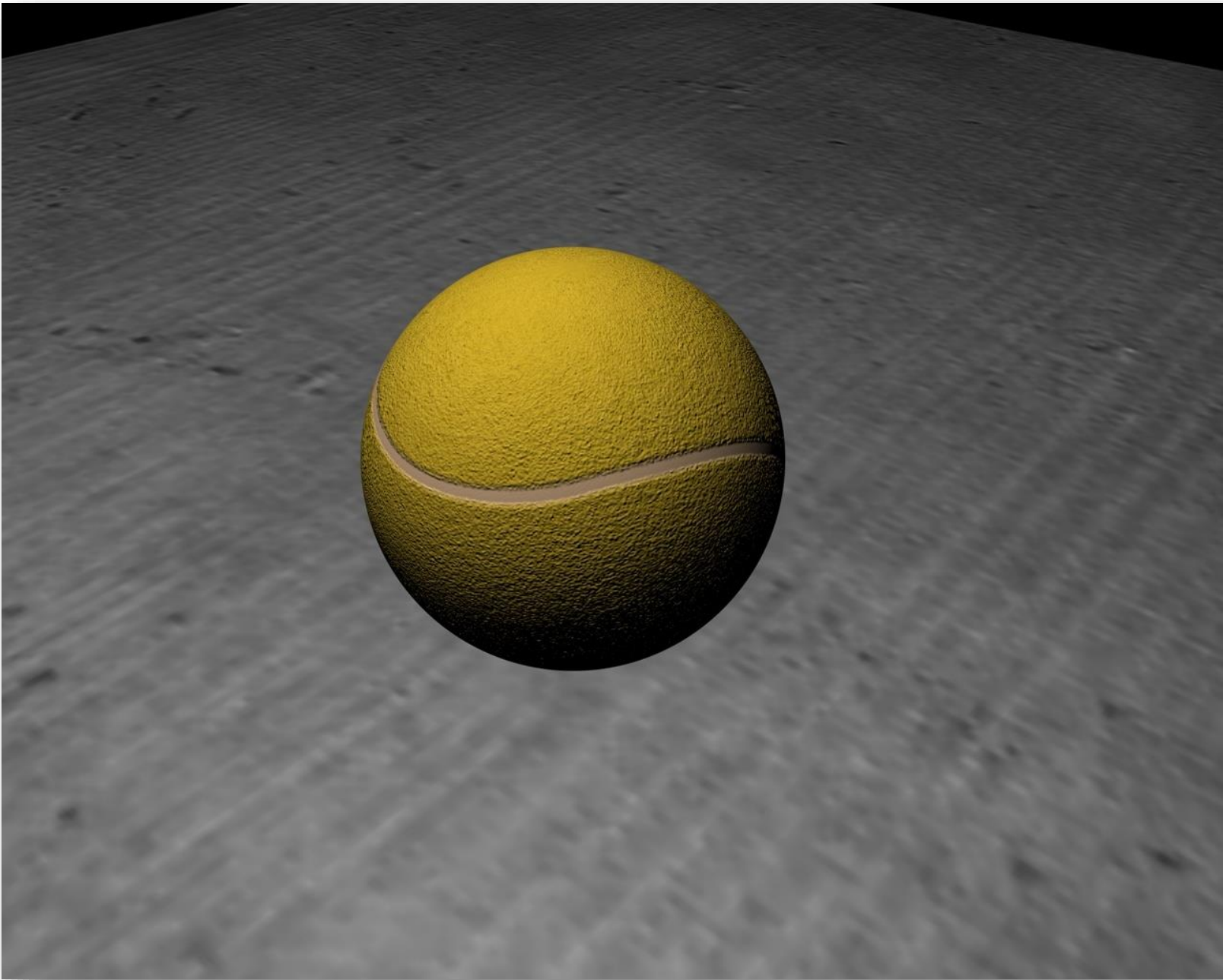
Lastnosti lic

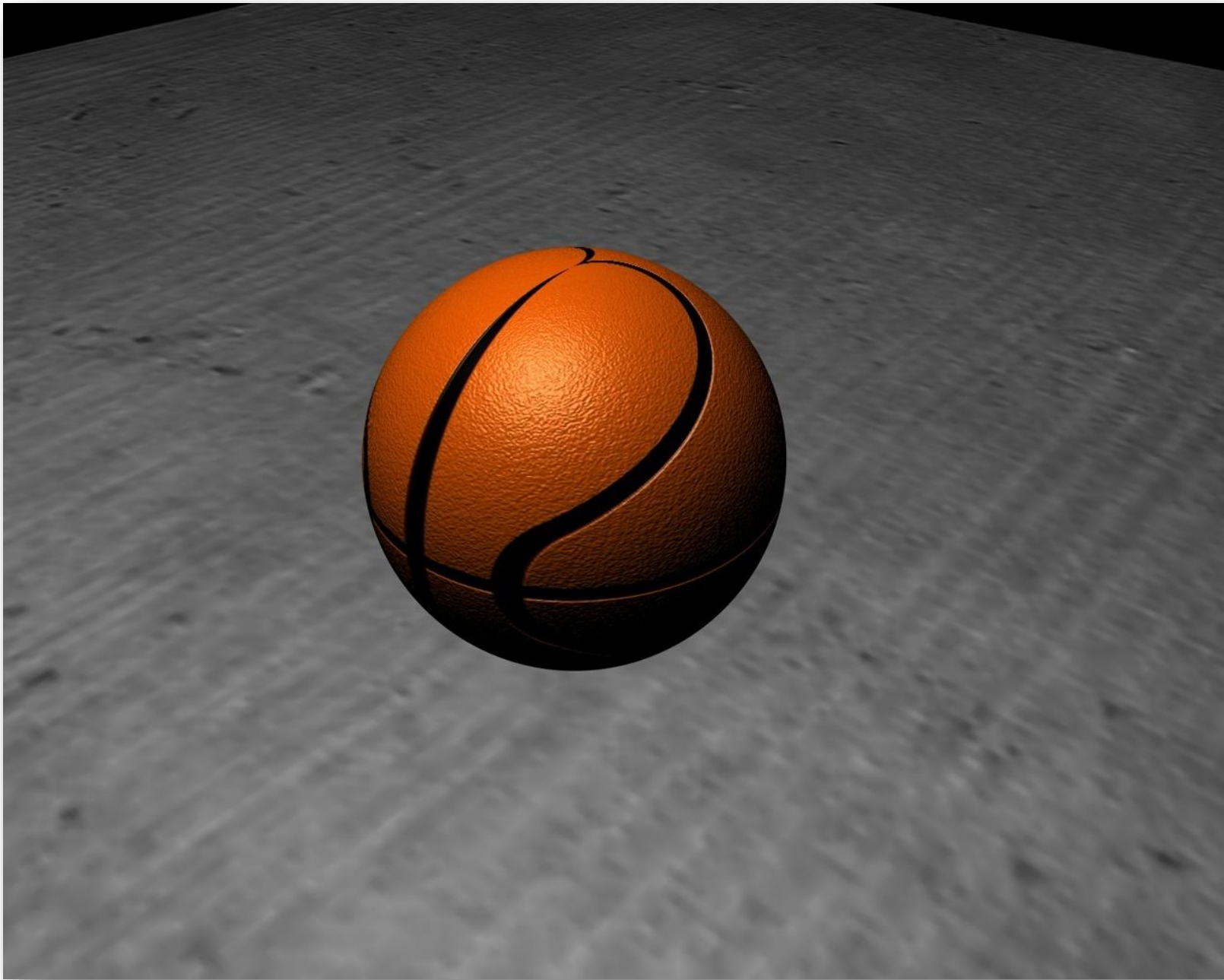
► Bleščeči (specular) odboj

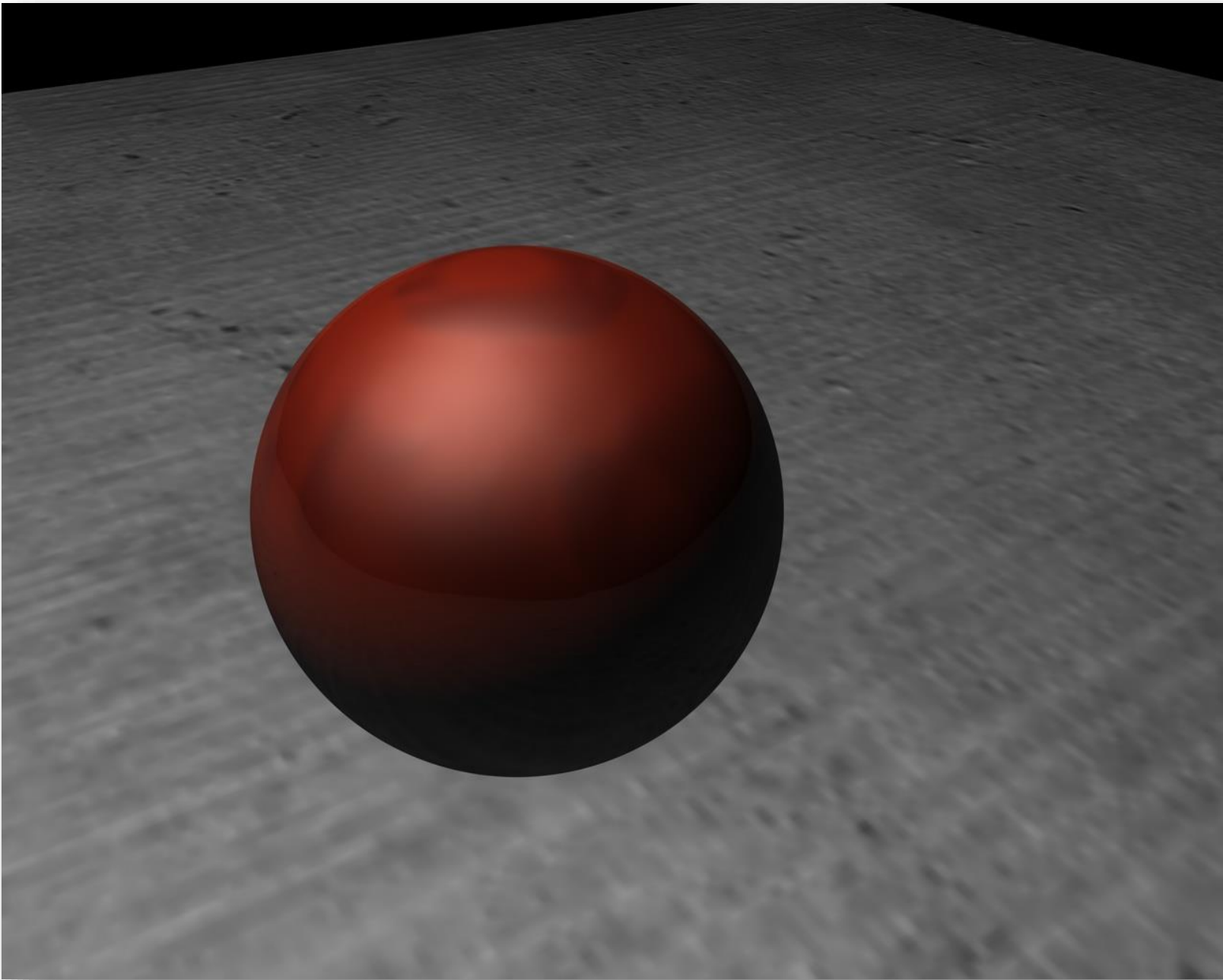


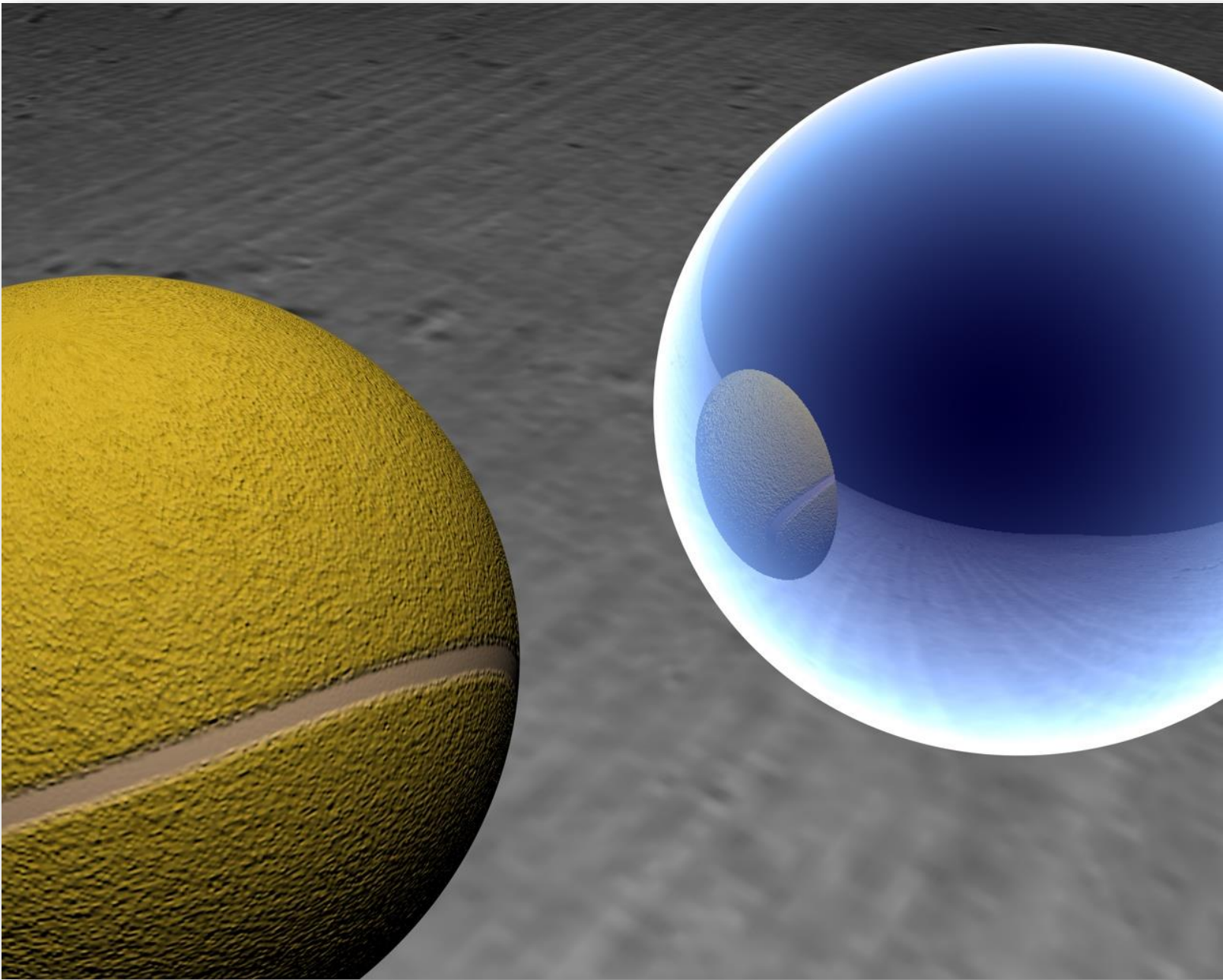
► Zrcalna odbojnost











Senčenje (shading)

Izkustveni modeli

- ▶ Poenostavitev izračunov
 - ▶ Izkušnje
 - ▶ Estetske aproksimacije

- ▶ To so lokalni modeli:
 - ▶ Ambientalna svetloba
 - ▶ Razpršeni in bleščečo odboj
 - ▶ Zmanjševanje intenzitete z oddaljenostjo

Prehodni modeli

- ▶ Globalni modeli:
 - ▶ Prosojnost, zrcalni odboj in sence

Analitični modeli

- ▶ Energetsko ravnotežje:
 - ▶ Algoritem izsevnosti

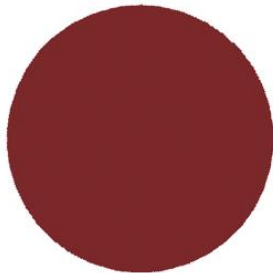
Hibridni modeli

- ▶ Prehodni (sledenje žarkom) in analitični (izsevnost)

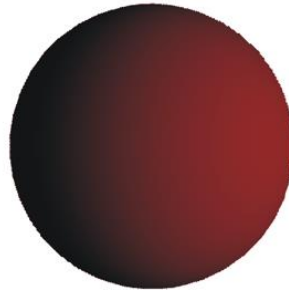


Senčenje (shading)

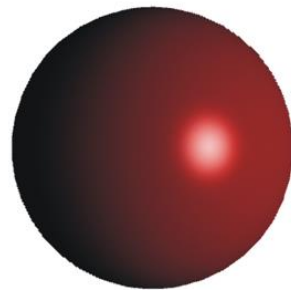
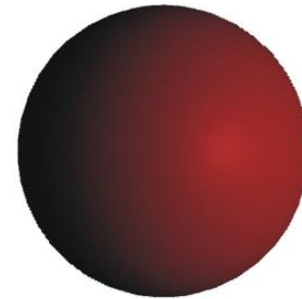
konstantno



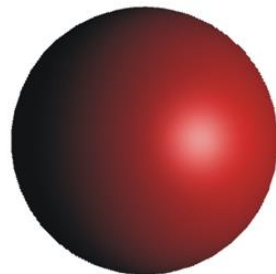
Lambertovo



Gouraudovo



Phongovo



Blinnovo



Senčenje (shading)

- ▶ Konstantna intenziteta na ploskvi
 - ▶ konstantno senčenje (le material ter ambientno svetlobo)
 - ▶ Lambertovo senčenje (še difuzni odboj)
- ▶ Interpolacija intenzitete na ploskvi (Gouraud)
- ▶ Interpolacija normale na ploskvi (Phong)
- ▶ Blinnov algoritem: dodaten parameter (ekscentričnost) za razprševanje bleska.

