

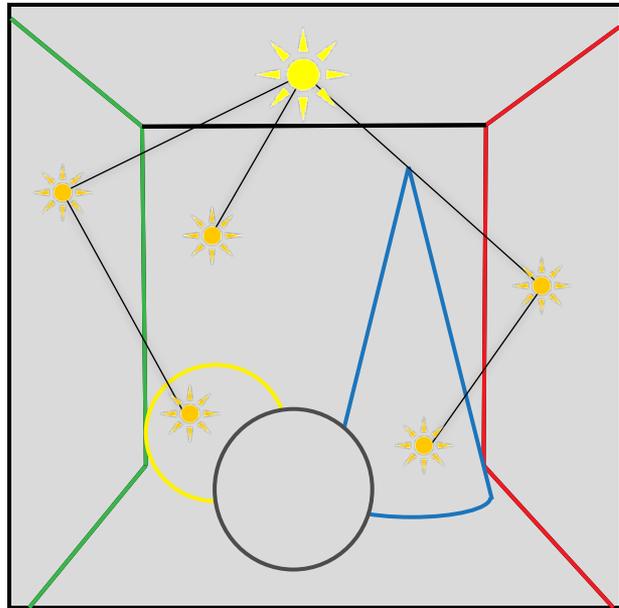
# Global Illumination

- Metropolis Light Transport
- Instant radiosity & “Many-light methods” derived from instant radiosity
  - Lightcuts
  - Matrix Row-Column Sampling
  - Real-time variants of instant radiosity
- Rendering participating media (Fog etc.)
- Subsurface scattering (milk, skin etc)

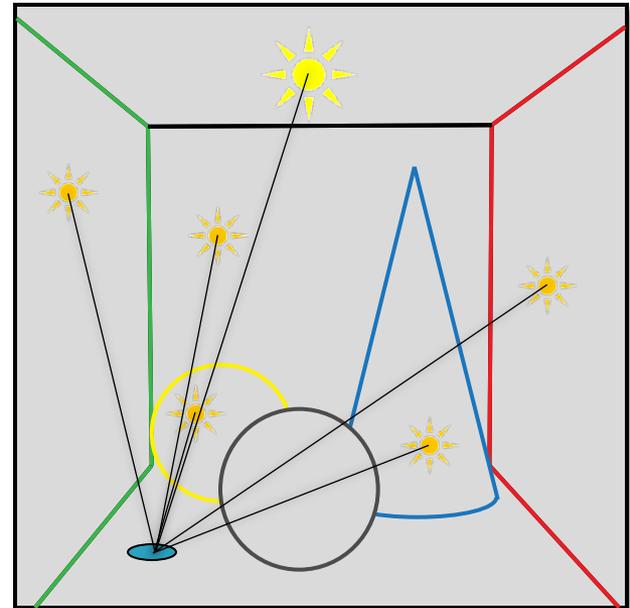
# Instant radiosity (VPL rendering)

- [Keller 1997]
- Approximate indirect illumination by **Virtual Point Lights (VPLs)**

1. Generate VPLs



2. Render with VPLs



# Research challenges in rendering

- Existing algorithms are inherently bad for some practical scenes



- More work to do for rendering researchers

# What else in CG

- Main general CG conferences
  - SIGGRAPH (ACM Transactions on Graphics – TOG)
  - SIGGRAPH Asia (ACM TOG)
  - Eurographics (Computer Graphics Forum)
- <http://kesen.realtimerendering.com/>

# What else in CG

- Computational photography
- Appearance modeling & capture
- Animation (& capture)
- Dynamic simulation (hair, cloth, water, smoke, solids...)
- Visual perception
- Natural phenomena
- Non-photorealistic rendering
- Sound simulation
- Display technology
- Interaction technology
- Geometry modeling

# General challenges in CG

- Making it usable (!!!)
- Robust lighting simulation in general scenes
- Virtual human
  - Hair modeling (!!!)
  - Cloth
  - Animation (!!!)
- Managing complexity
  - Natural environments etc
- ...and more (the above is my random choice of “grand challenges”)