



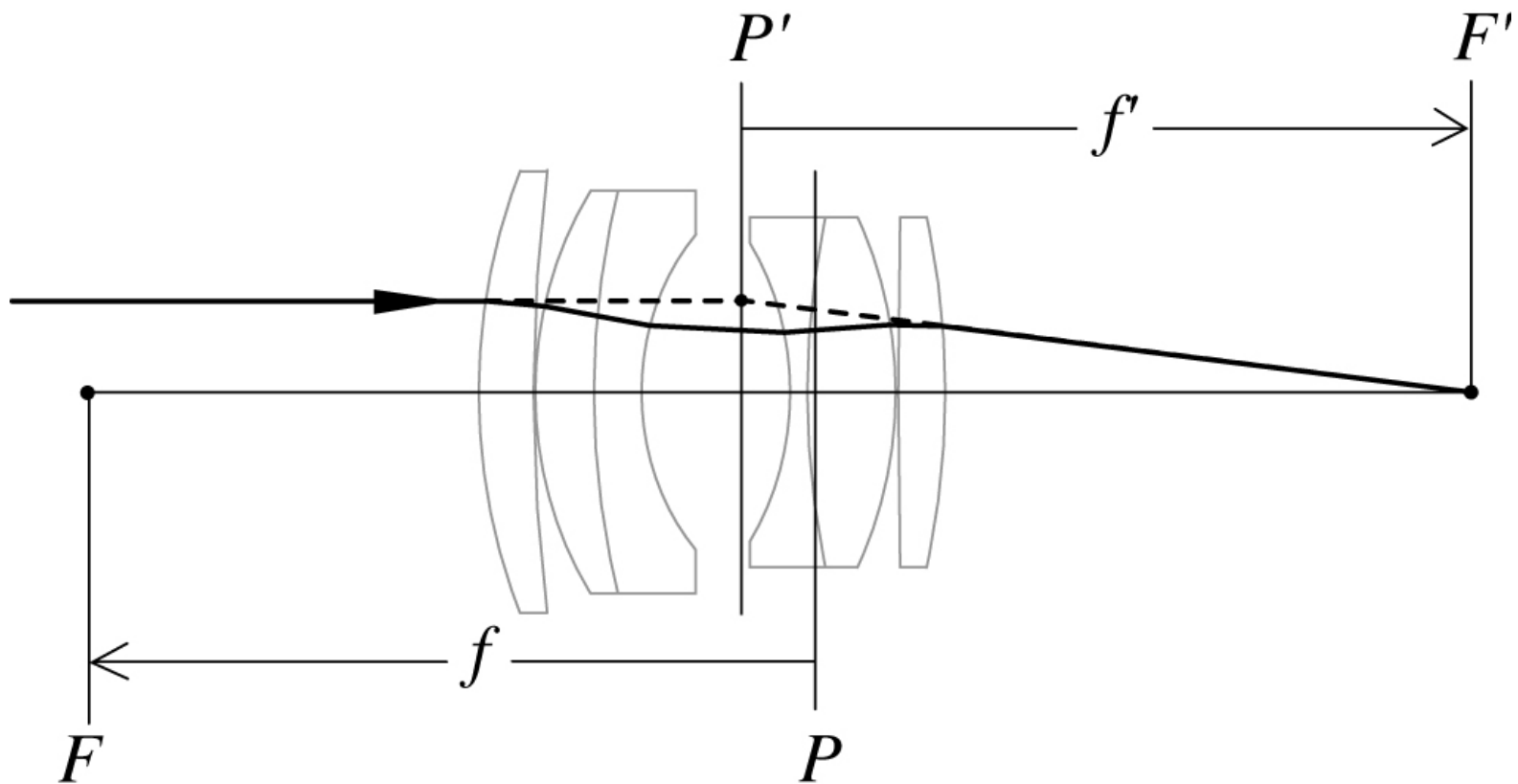
CS 563 Advanced Graphics

Time-varying BRDFs: Weathering, etc

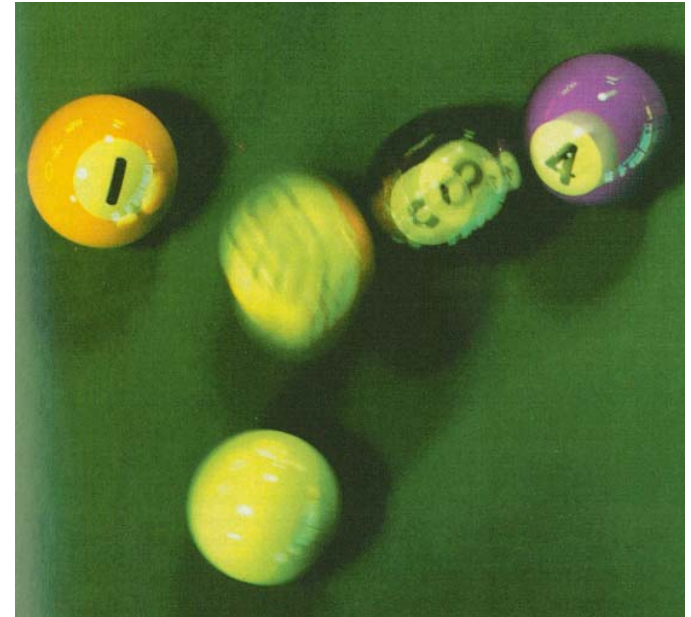
by Emmanuel Agu

Physically-based Camera

- Kolb et al, *SIGGRAPH 1995*
 - Pin-hole camera too simplistic, everything in focus
 - Real camera has multi-lens assemblies
 - Has different imaging characteristics such as limited depth of field, field distortion, vignetting and spatially varying exposure.



- Motion blur
 - Notion of time
 - Average out what you see through a pixel at different times
 - Cast multiple rays from eye through same point in each pixel
 - Each of these rays intersects the scene at a different time
 - Reconstruction filter controls shutter speed, length



Time-varying BRDF

- BRDF: How different materials reflect light
- Time varying?: how reflectance changes over time
- Examples: weathering, ripening fruits, rust, etc



TV BRDF Recent Developments

- J. Wang, X. Tong, S. Lin, M. Pan, C. Wang, H. Bao, B. Guo and H. Shum, "[Appearance Manifolds for Modeling Time-Variant Appearance of Materials](#)" ([Video](#)), ACM Trans on Graphics, Vol. 25, No. 3, 2006 (Siggraph '06 Proceedings)

[SIGGRAPH VIDEO](#)

- Bo Sun , Kalyan Sunkavalli , Ravi Ramamoorthi , Peter N. Belhumeur , Shree K. Nayar, Time-Varying BRDFs, IEEE Transactions on Visualization and Computer Graphics, v.13 n.3, p.595-609, May 2007

[VIDEO](#)