1086-AD-251 **Ravi Ramamoorthi*** (ravir@cs.berkeley.edu). *Sparse and Multiresolution Representations of Visual Appearance.*

One of the key challenges of computer graphics is to represent and understand the visual world. The material properties of objects, from the characteristic look of a human face, to the reflections off a velvet cushion, to the translucent appearance of leaves, require new mathematical approaches to digitally model visual appearance.

The complexity of appearance is enormous, with accurate modeling needing to consider its variation across the surface from every viewing direction, and lit from any incident direction. Similar problems occur in relighting synthetic scenes, or using high-dimensional Monte Carlo rendering for image synthesis.

In this work, we show several recent examples where exploiting the sparse, lower-dimensionality, or compressibility and multiresolution nature of visual appearance can lead to dramatic improvements in computer graphics algorithms. We showcase examples from real-time rendering, offline image synthesis and appearance and light transport acquisition. (Received August 13, 2012)