CMSC 635

Image-Based Rendering

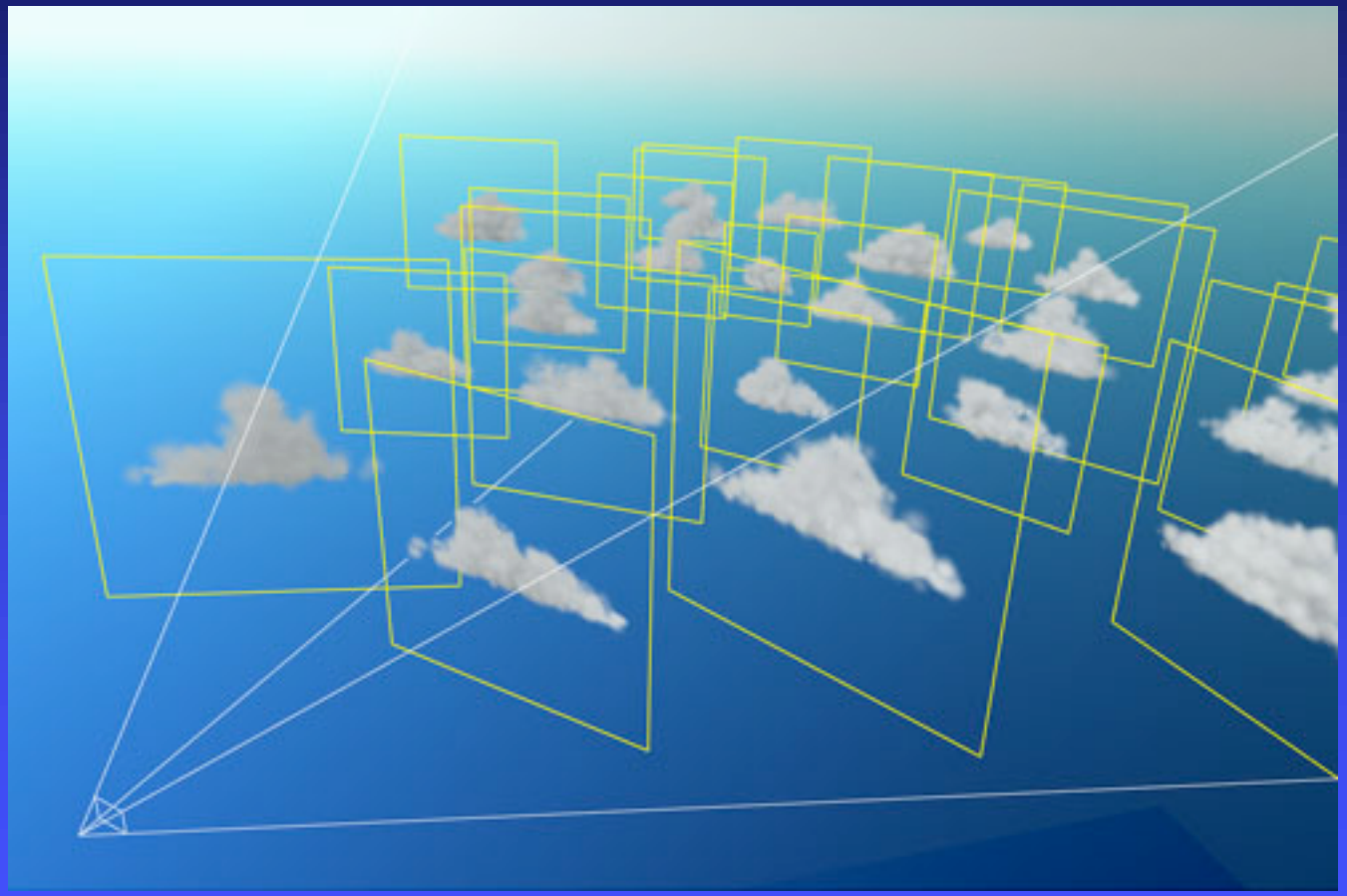
IBR spectrum

- Geometry
- Billboards & impostors
- Depth images
- Depth sprites
- Layered Depth Images
- Image-only rendering

Billboards

- Flat polygon
- Texture + opacity
- Orient to face viewer

Billboards



Billboards

Impostors

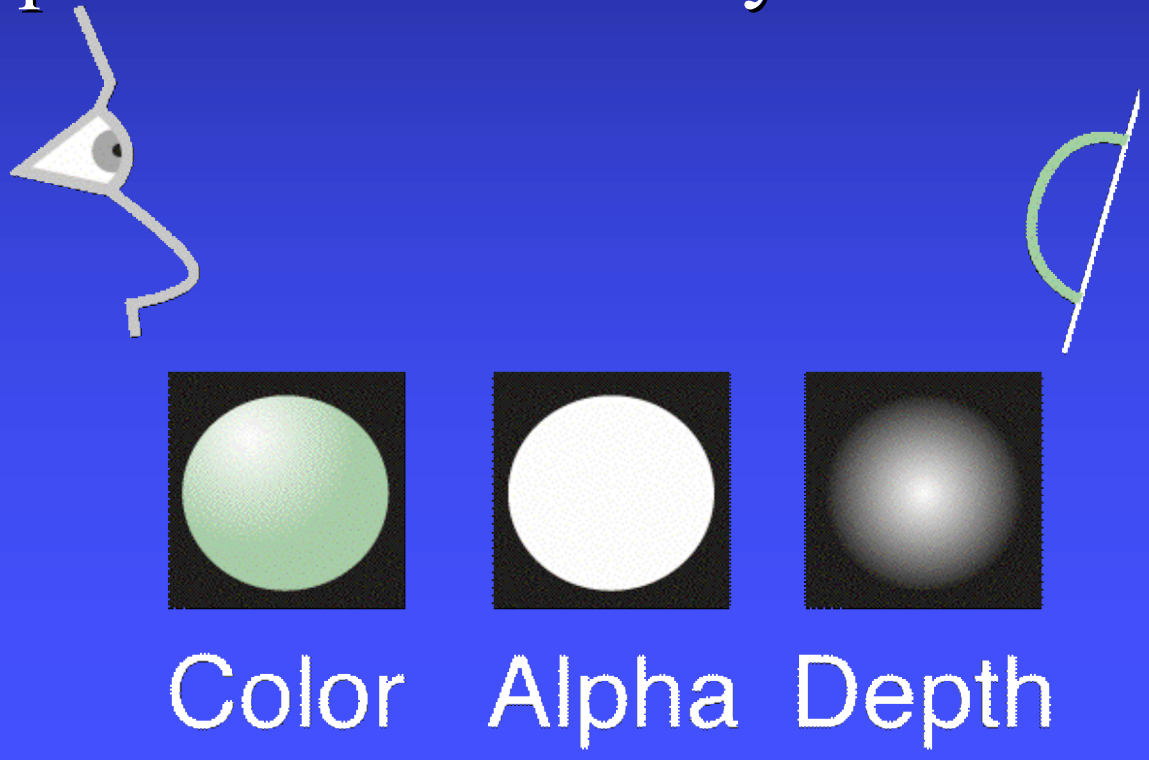
- Run-time generated billboard
- Replace object

2.5D & Depth images

- Fixed view
- 2.5D
  - Cell animation
  - Flat layers
- Depth images
  - Save image + z-buffer
  - Render new objects into scene

Depth sprites

- Billboard + Depth texture
- Update when necessary



Layered Depth Images

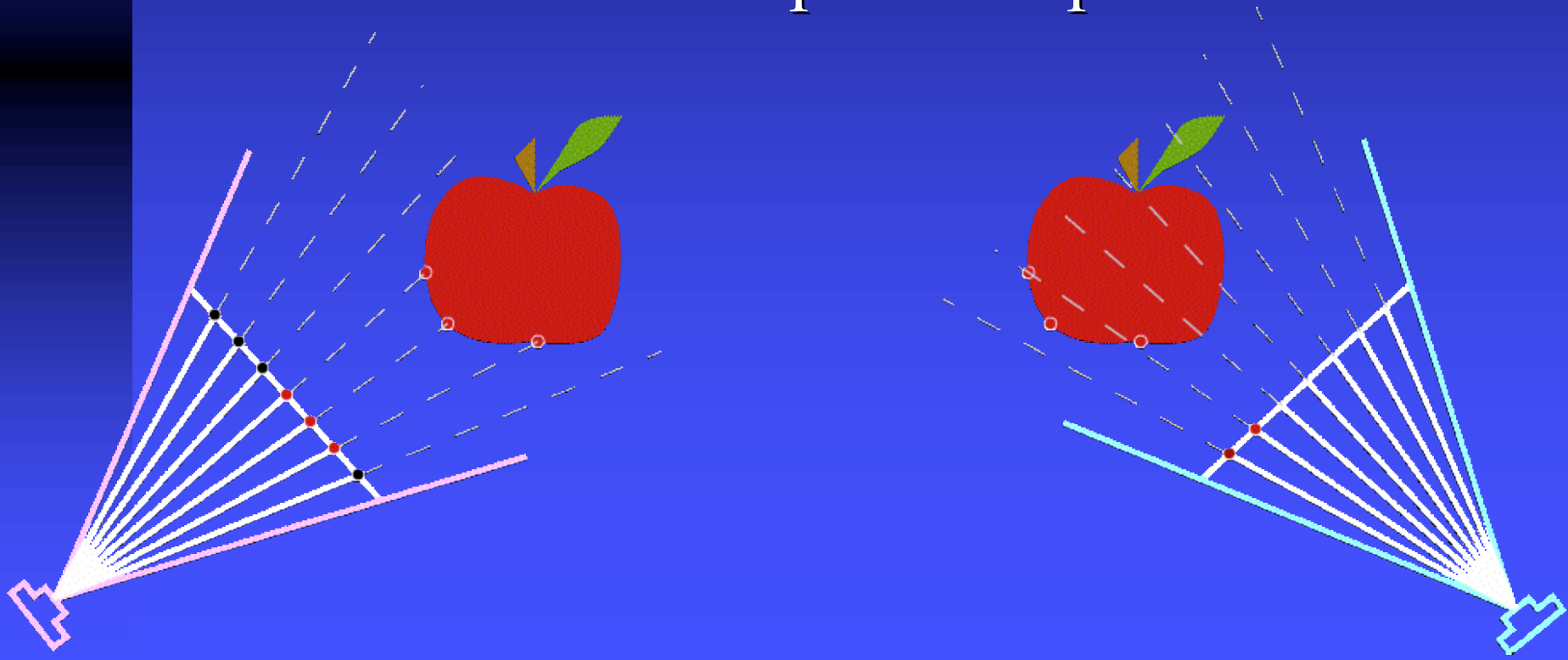
- Layers or shells
  - Polygons
  - LDI
  - Depth Sprites
  - Planar Sprites
- Multiple values + depths per pixel
- Warp to render from new point of view

Image-only rendering

- “True” IBR
- IN: Images or Images + depth
- OUT: Image from new viewpoint

Warp-based

- Warp pixels source image to new image
- Pixel = color for a point in space

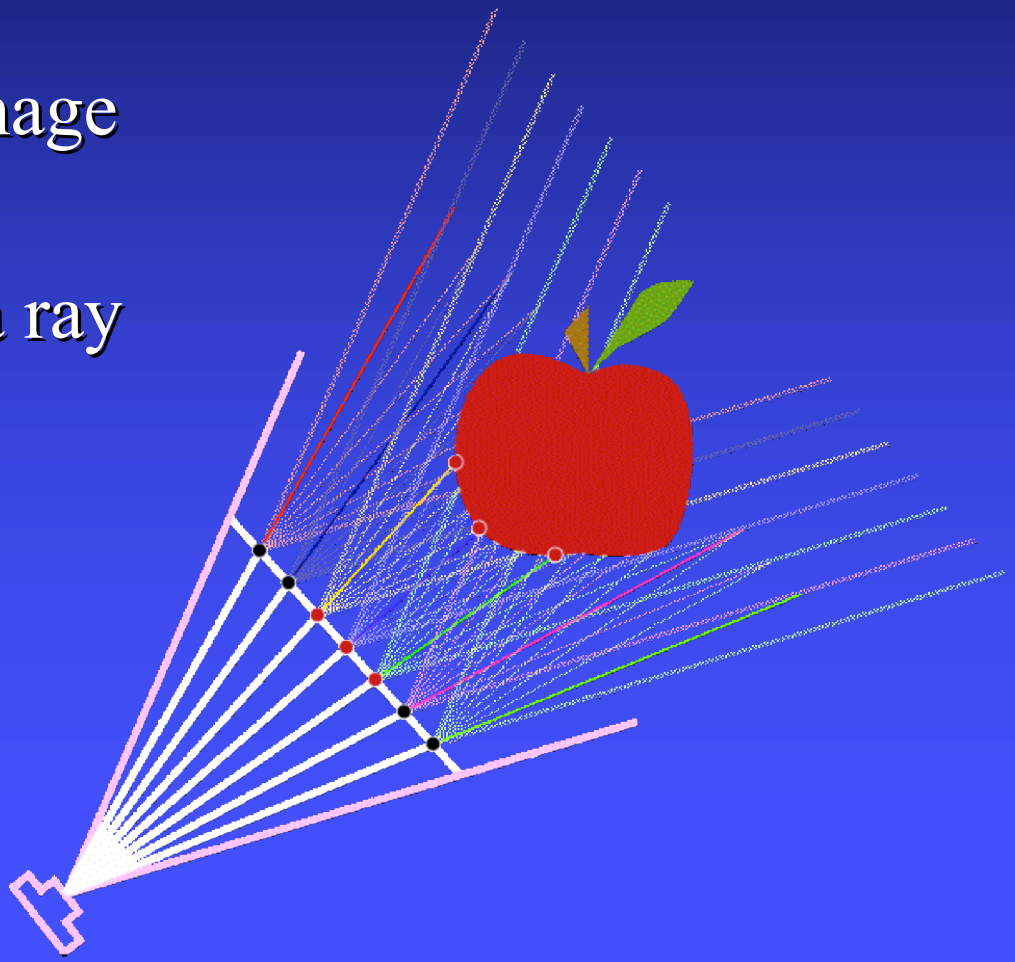


Warp-based

- Occlusion compatible ordering
- Simple relationship to images
- Requires depth, multiple images
- No view dependent shading

Light-Field / Lumigraph

- Find stored rays similar to new image rays
- Pixel = color of a ray through space



Light-Field / Lumigraph

- Handles view-dependent shading
- 4D parameterization of space
- Sampling
  - Focal plane spacing = aliasing
  - View point spacing = depth of field
- Lots of data