Environment Mapping

In practice
- Shiny spheres
  Gene Miller
- Interface
  (L. Williams 1985)

Story of Reflection Mapping
Paul Debevic's Story of Reflection Mapping
http://www.pauldebevec.com/ReflectionMapping/

Gerri’s Game
Sphere Mapping Demos

Spherical Environment Maps

- **Pros:**
  - Single texture (no "ifs")
  - Triangles don’t span texture boundaries
    - Per-vertex computation!
- **Cons:**
  - Bad sampling
  - Only works for single viewpoint / view direction

Parabolic Environment Maps
Cube Environment Maps

- Per-fragment
- Supported in HW
- No warp (perspective maps)

Cube Environment Mapping

Skybox

- Big box with the environment map on it
- Draw a box around the viewer and cubemap it
  1. In eye-space
  2. Rotate the cube by upper-left 3x3 modelview and draw in world space (ensuring far plane doesn’t clip)
- Render a full-screen quad (NDC space)
  1. Compute the texture coords for the corners of the viewport (by full-screen quad rotated by the 3x3 modelview)
  2. Cubemap it
Paul Debevec

- St. Cross
- Panorama stitching
- Cube projection