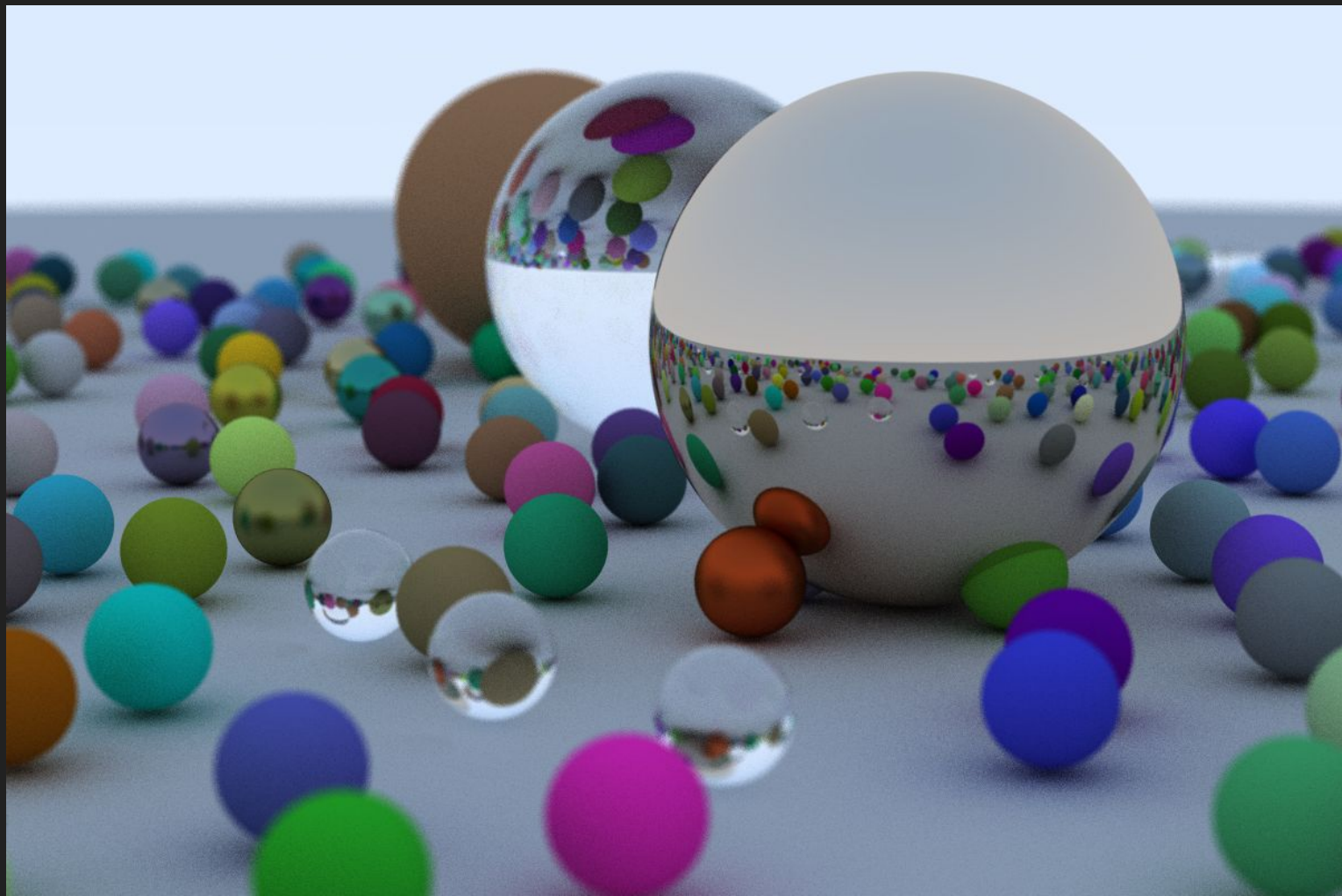


# GPU-Accelerated Ray Tracer

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# What Is Ray Tracing?

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## Advantages:

- Global Illumination Technique
  - Realistic Lighting
- Many Application Areas
  - Films
  - Animations
  - Games
  - Product Design
  - Architecture
  - Scientific Visualization

## Disadvantages:

- Performance Intensive
- Difficult to employ for real-time applications

# Our Ray Tracer

- Use OpenGL compute shaders (in GLSL) to speed up computation
- Use 3D textures and anti-aliasing to make rendered image smooth
- Support Different Material Types:
  - Diffuse
  - Metal
  - Dielectrics (like Glass)
- Positionable Camera
- Defocus Blur (aka Depth of Field)

# OpenGL Compute Shaders To Speed Things Up

- Our tracer renders the image below in about 7 minutes.
- The reference CPU tracer takes about 18 minutes to render it.



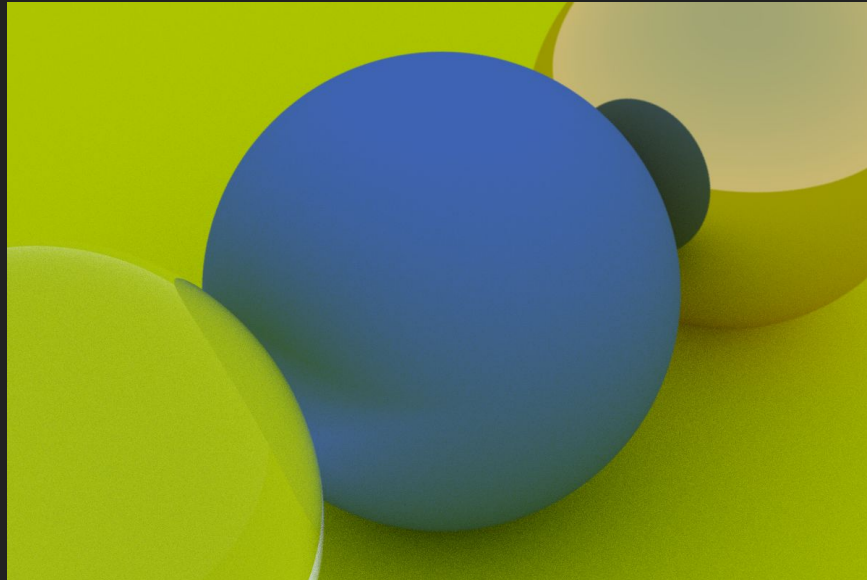
# Anti-Aliasing

- Before (Left): Pixelated image with rough edges.
- After (Right): Smoother edges.



# Positionable Camera

- Render scenes in different interesting ways.
- Ability to control FOV and camera orientation.





Questions?