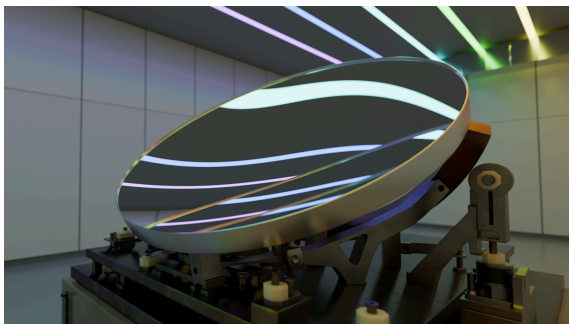
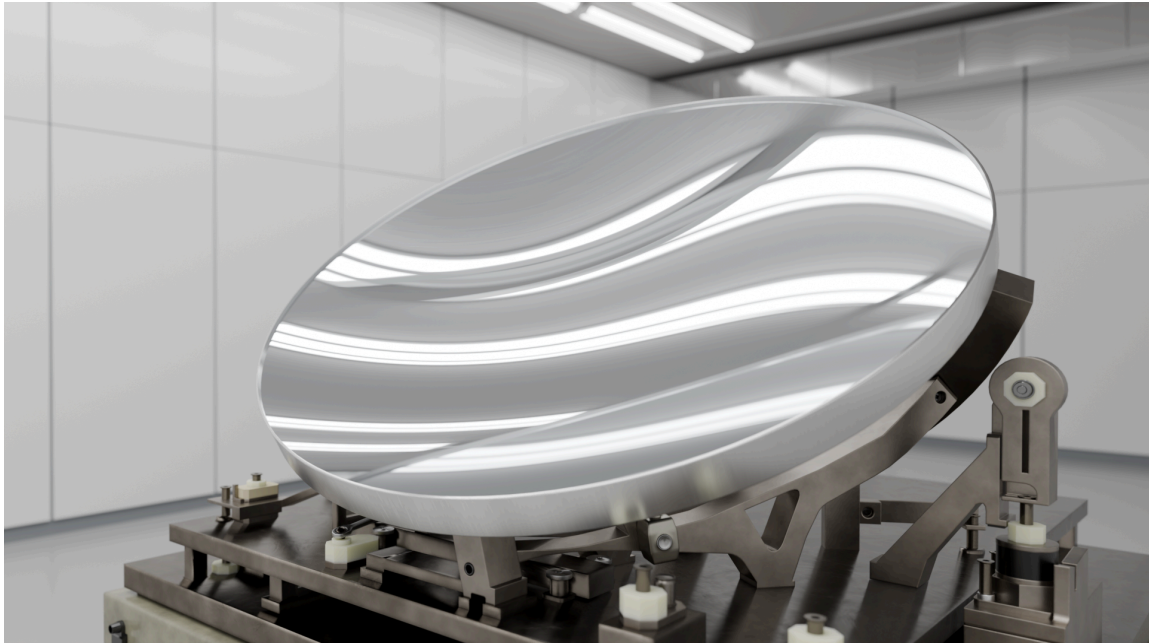
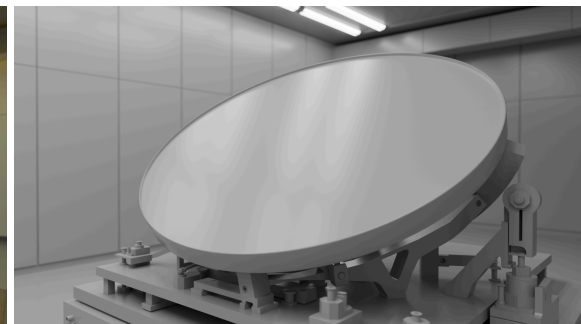


CS148 Final Project

Ben Wengreen



(Variant A: Different Angle and Lighting)



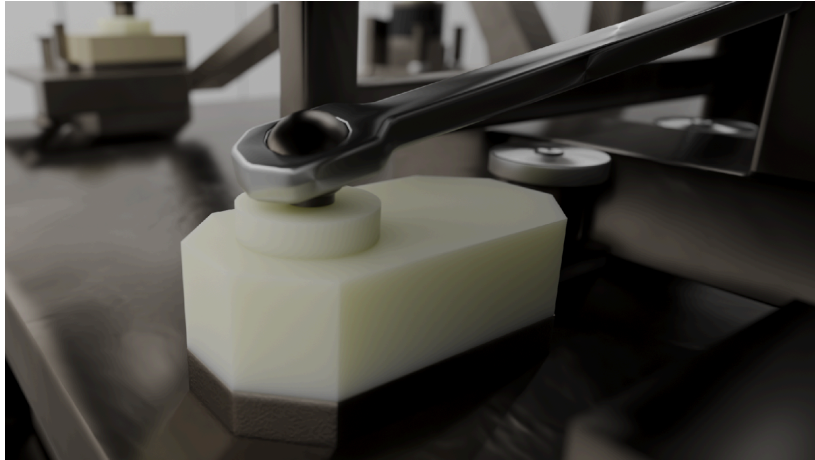
(Variant B: Without Textures)

https://drive.google.com/file/d/1lqiY4DasSArDLprGvd1QNtBB_ft8nCyK/view?usp=sharing

1. Project Requirements

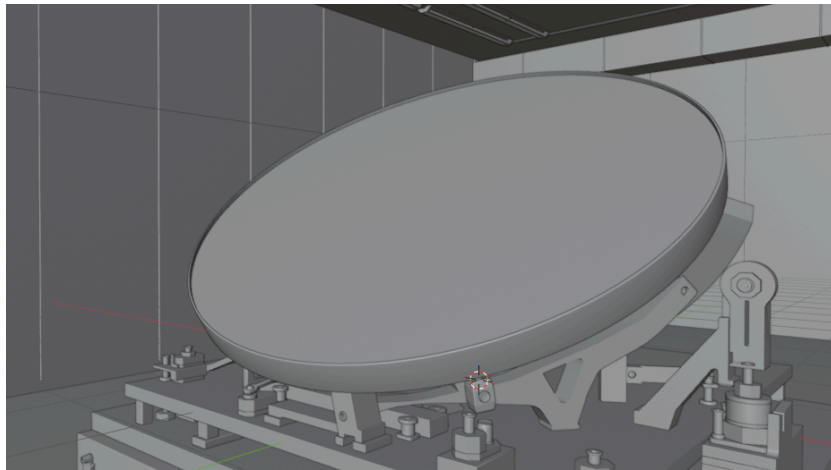
i. Leveraging Ray Tracing

This project extensively uses environment reflections, such as the parabolic mirror reflecting a distorted reflection back to the camera, which is enabled by cycles rendering. It also uses area lights to model the light coming from long tube lights often found in clean rooms. Cycles also enables the subsurface scattering used on the octagon-shaped, milky white plastic (probably acetal) screw leads and the anisotropic reflections of the brushed aluminum mirror ring (plus other smaller components).



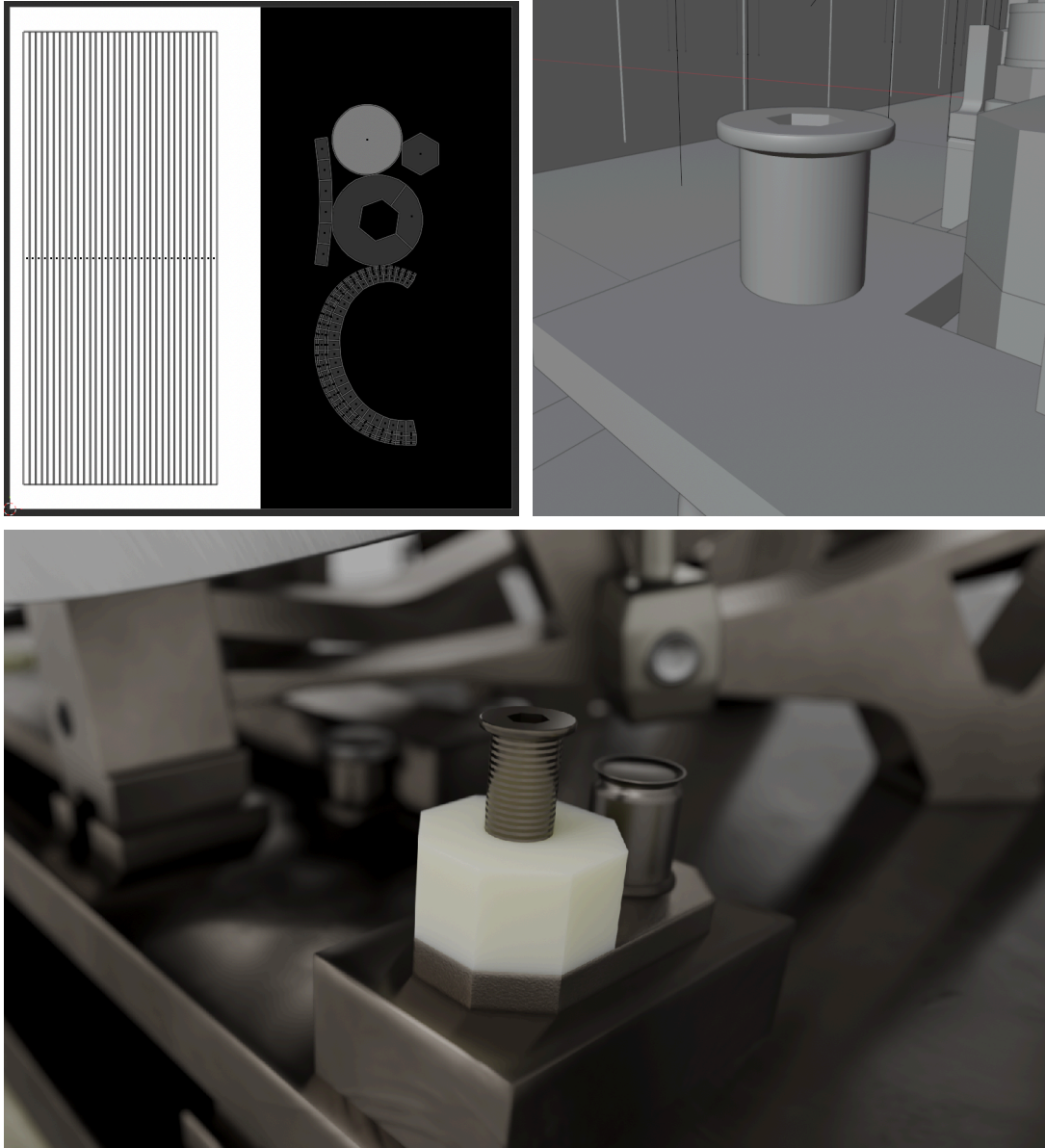
ii. Create Main Geometry

All of the geometry and shaders in the scene were created from scratch using Blender's modeling tools, including the parabolic mirror and alignment rig. I started from cubes, cylinders (sometimes set to be polygon prisms), circles, planes, and spheres. The parabolic mirror was created from a subdivided circle with a bump and displacement applied using a parabolic equation defined by the focal distance.



iii. UV Mapping and Texturing

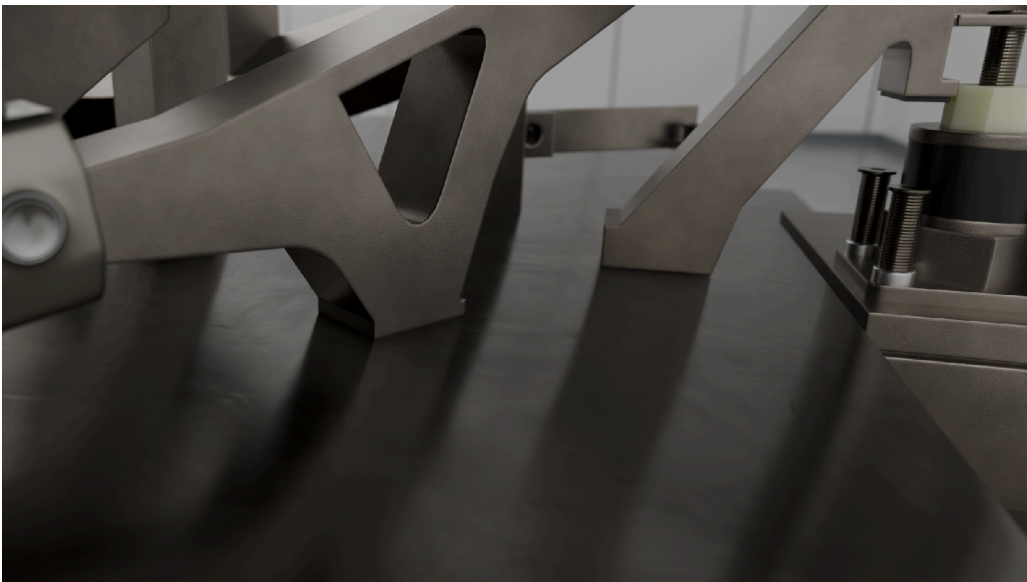
I used UV mapping to texture the back walls and the screws. The UV mapping was used to map separate procedural textures (shaders) to different parts of the model, such as procedural thread normals to the screws; and a grey material in-between the wall panels and as the trim where the walls meet the floor.



I also created all of the shaders/textures in the scene from scratch. Below are a few of the shaders I made.



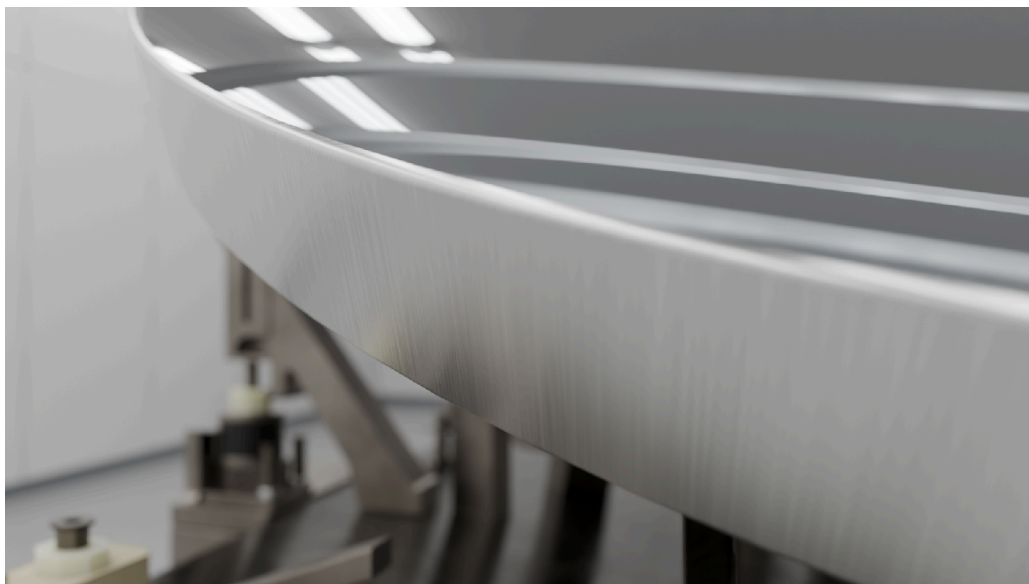
(Powder Coated Steel)



(Hardened Steel)



(Painted Ceiling)



(Brushed Aluminum)

iv. Advanced Blender Feature

The advanced blender feature I used was depth of field, which caused objects far away objects like the vent and wall corner to become blurry, in addition to very close objects, such as the very front adjustment screw. This makes the render look more realistic, since this is closer to how humans perceive the world.

2. Group Contributions

I worked by myself, so all the contributions were mine.

3. Asset Sources

I made all of the geometry and shaders from scratch. I used a photo of a parabolic telescope mirror in a lab that seems to be from [Stock Titan](#) as a reference image. I also have a background HDRI in the Blender file from [AmbientCG](#) (that I use in the Eevee preview to see reflections) which is not used in the final render.

4. Tutorials

I modified the marble shader I made in a previous assignment for the polished concrete base. I watched a granite shader tutorial from [Glen 3D](#) to get started making the original marble shader.