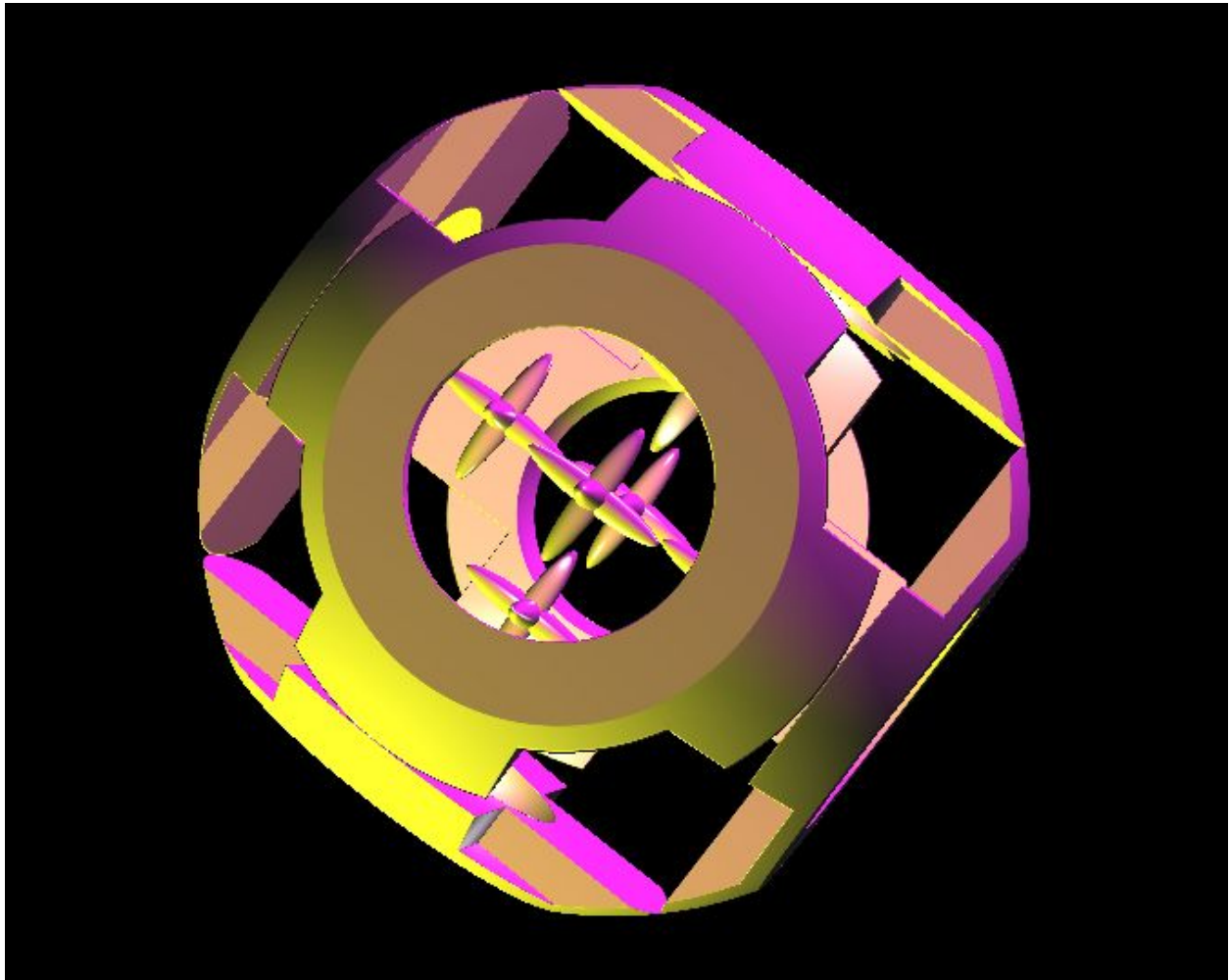


Spencer Witkin  
CMPM 163  
Homework 3

**Part B**

<https://exp13.github.io/CMPM163-HW3/toySDFs.html>



For part 2 I used the basic setup from the tutorials we went over and found on shadertoy. Then I wanted to figure out how to get rotation working so I added that and decided to make this cool transforming shape combination using all the pieces of SDF I could figure out.

(this might look different than the picture by the time you grade I am enjoying playing around with it.)

## **Part C**

Topic: Ambient Occlusion

Ambient Occlusion is a method to approximate Global Illumination using a different method that is cheaper and more efficient even though not as accurate or realistic. To simulate shadowing on objects Ambient Occlusion takes into account objects blocking light sources from reaching other objects. For example in our most basic phong shaders light can pass through all geometry like it isn't there and lights objects on the other side as if nothing is there. If ambient occlusion was used it would darken the parts of the object that has its light blocked by other objects.

A basic method used for Ambient Occlusion (AO) is Screen Space ambient occlusion (SSAO). SSAO uses a depth buffer (z-values) and samples the buffer and points around each buffer pixel to approximate the occlusion. A more advanced method is Horizon Based ambient occlusion and HBAO+.

One way I could see implementing it is with SDFs. In my current Part B shader I could check if the light is hitting other objects before deciding to color a pixel with the light. This only works easily in SDF because I have all of the ray marching functions defined.