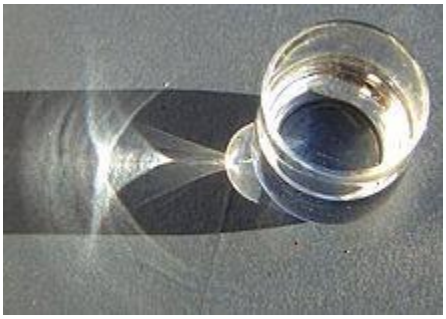
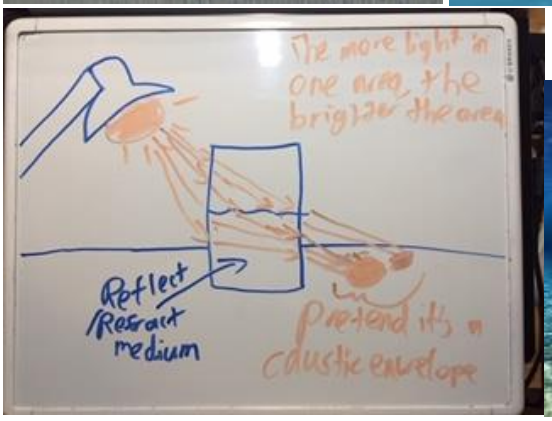
Caustics

A caustic is a projection of enveloping light rays, that is, a combination of intersecting light rays based on refraction and reflection properties of a curved surface or object. It seems to be an application of volumetric rendering, but instead of shooting a ray of light through a volume, it is being shot through a surface. If certain light rays are projected onto a similar area, then that area is brightened. However, if there are very few rays being projected onto an area, that area is darker than the others.






(The areas where light rays meet up the most are the bright part of the caustic)

If this was to be implemented, I would have to constuct a surface that supports reflection and refraction in its material. Given a light source and a projection surface, the shader would calculate their direction of travel based on the object's material and the areas they commonly project onto. Those areas will have a higher brightness value than the others, composing the "envelope" of the caustic. This will all be in the fragment shader. The vertex shader won't play any key role for producing caustics, since no vertices are being altered in any way.