

# Shader Final Project

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## **Final Proposal:**

In my final proposal, I want to create a scenario where a meteorite falls to Earth. Upon impacting the Earth, it will affect the surface of the planet. First, I will create two spheres, one large and one small, representing the Earth and the meteorite, respectively. I will then find bmp images of the Earth and the meteorite and apply these to their textures. Following this, the design will focus on the shader. I expect that when the meteorite hits the Earth, the surface will initially show a fisheye-like crater, followed by a shockwave spreading across the entire surface, demonstrating the effect of Bump-Mapping. Finally, I will establish a keytime that continuously loops the meteorite impact, the fisheye effect depression, and the Bump-Mapping effect of the shockwave.

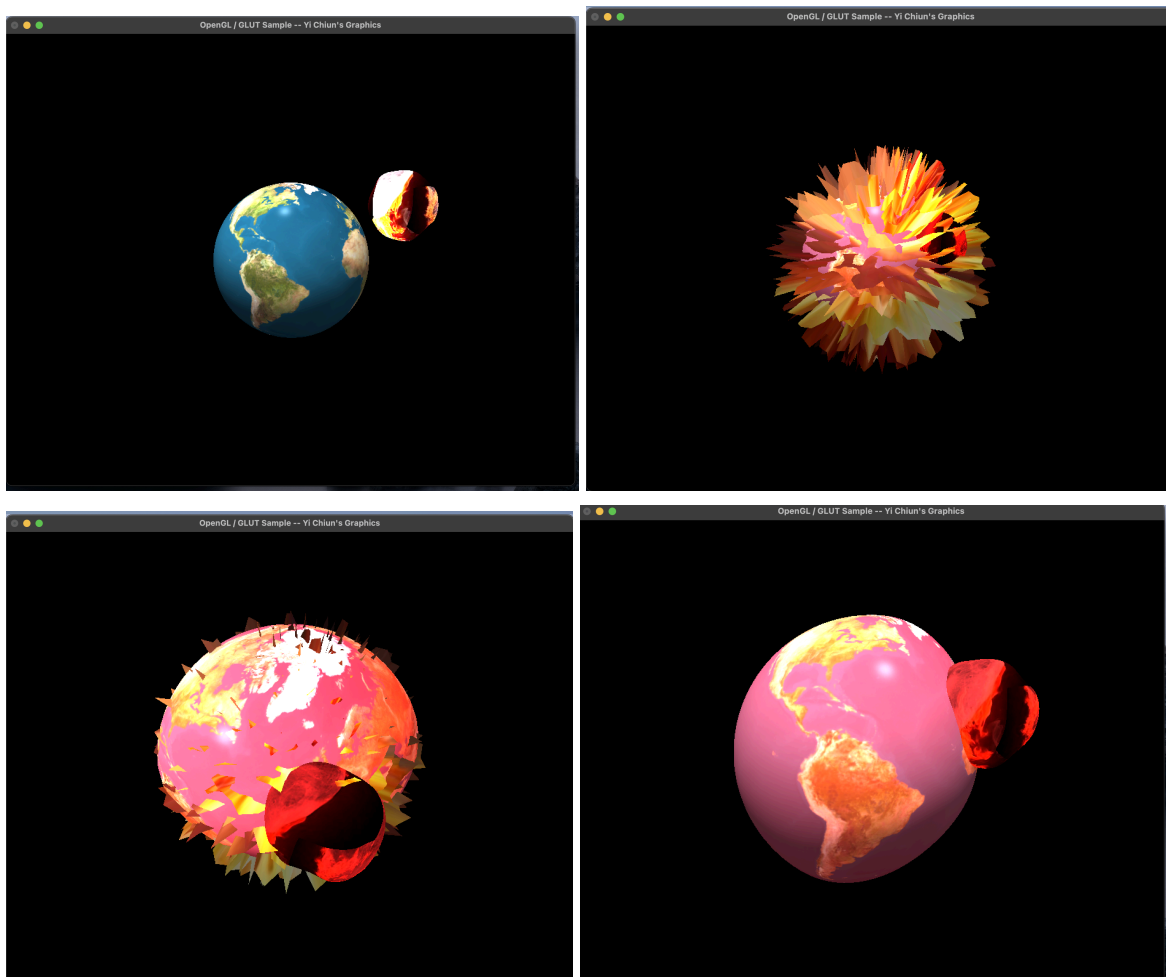
## **A description of what I did:**

In the final project, I called a total of three objects, namely earth, asteroid, and inner earth. Therefore, I also created three pattern functions to manipulate the vertex shader and fragment shader of each pattern. The first pattern.vert and pattern.frag are used to manipulate the inner earth. In the vertex part, I created an explosion function to simulate the effect of explosion and fire, and used uTime to control the timing of the explosion effect. Then, in the fragment part, I used a bump texture so that when the asteroid collides with it, there will be an explosion effect. The pattern1.vert and pattern1.frag are used to control the earth. In the vertex part, I used displacement mapping effect. The earth sinks inward when hit by the asteroid. Since only one side of the earth is hit, only half of the earth will have the displacement effect. In the fragment part, I used uTime to control the color of the earth texture. When the asteroid collides, the earth turns red. The pattern2.vert and pattern2.frag are

used to control the asteroid. In the fragment part, I created an explosion color to control the color of the asteroid and combined it with the explosion effect. As the asteroid approaches the earth, the color becomes more red, achieving the effect of smashing towards the earth. I used keytime values to control the effects mentioned above, including controlling the position of the asteroid so that it comes from outer space towards the earth.

In the proposal, I mentioned using bump mapping and fisheye effects in final project proposal, but since these were used in previous projects, I decided not to use them in this final project. Instead, I added many explosion effects, which are parts mentioned in my proposal but not implemented, as well as effects that were not mentioned but added by myself.

### Screenshot:



Link: [https://media.oregonstate.edu/media/t/1\\_7f5feqy6](https://media.oregonstate.edu/media/t/1_7f5feqy6)