Final Project

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A Really Cold Place?

Overview

Our scene will consist of aurora borealis, water, terrain and shooting stars.

Effects

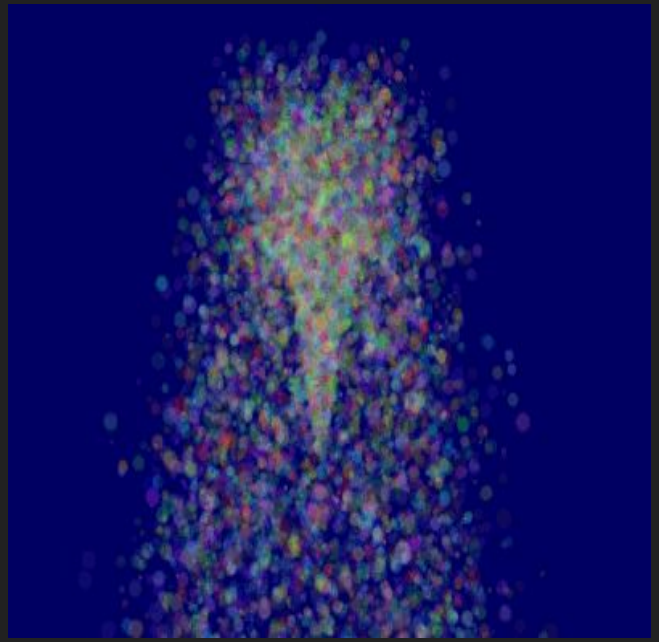
Aurora: moving textures mapped onto an inverted cube + glow

Water: reflection + refraction + noise

Shooting stars: particles + skybox

Terrain: Ice(reflection + shadow + roughness)

Shooting Stars Effect



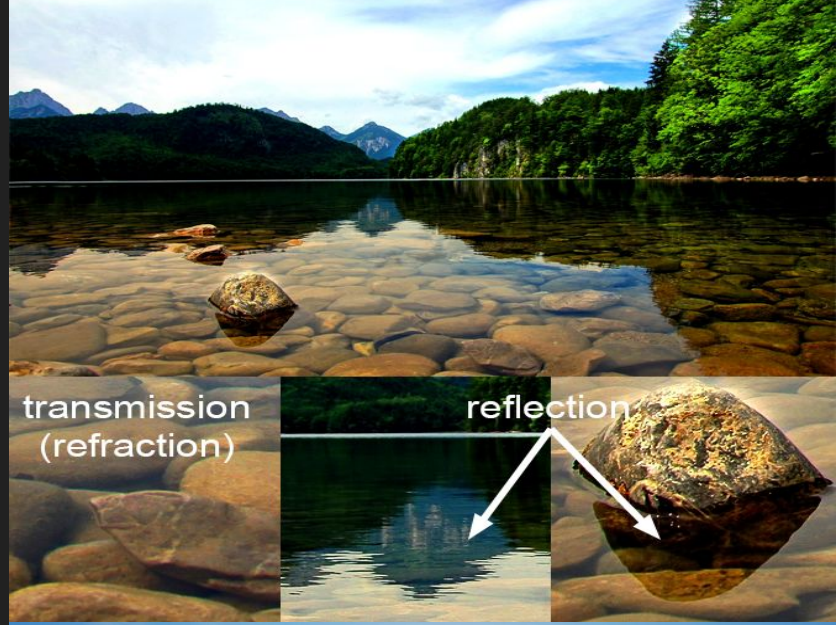
Example of Particles / Instancing, found at http://www.opengl-tutorial.org/intermediate-tutorials/billboards-particles/particles-instancing/

For this effect, the plan is to use an instancing method for particles, which applies various buffers to a base mesh. These buffers will change per instance of the mesh, hence the name. These buffers will be applied to the skybox mesh we will use and will accurately reflect on the bodies of water as well as the skybox, if done correctly.

Fancy Water

We plan to add some fancy water. We will add reflection that will be able to reflect anything in the scene. We also want to add refraction and the fresnel effect to it.

On top of this we will use noise to make the surface have swells and ripples as water does.

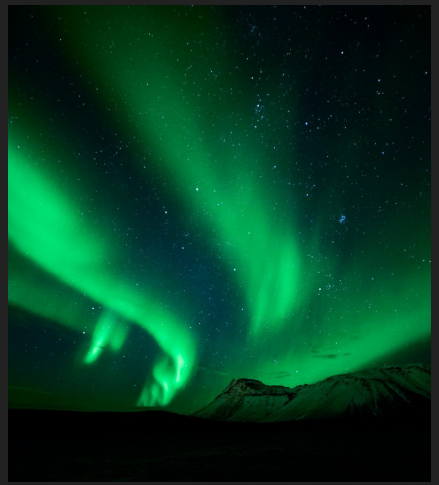


Frozen Land

The terrain would be covered by snow and ice. The roughness would come from a noise function and bump mapping. If possible, the ambient light would have impact on the general tone of the terrain. We might apply shadow-map for the shadows cast on the water.

Northern Lights

By using a series of sine (motion) and noise (functions, we can create 3D patterns using ray marching that simulate the motion and color of northern lights. These patterns will be generated on a cube and will serve as the background for the scene.



Rough draft:
https://s3.amazonaws.com/emmapy/aurora/auroras.html

Team Work

- Emma Yates: Northern light
- Evan Thomson: Water
- Mark Rahal: Shooting stars
- Zooey Zhang: Terrain

The process

Each of us will be working on one effect. Each effect will be written in a separate shader and rendered to framebuffers. When all the effects are ready, we will work together to integrate the shaders into the final scene.