

# Submission Group 19 - Cubecave - Alina Jaud, Jakob Kohlhas

## Scene Description

The scene is set in a cave. The camera, along with a spiky object (*cool rhombic hexecontahedron!*) with a point light above it, flies through the cave. As we descend into the cave, we eventually enter a small hall where a mysterious hollow cube, surrounded by colorful objects (*boring regular polyhedra*), is revealed. The cube rotates while light is emitted from within, casting shadows against the cave's walls.

## Implementation Details

### Features:

- Omnidirectional shadow mapping for the point lights inside the cube and above the spiky objects
- Volumetric godrays with dithering, bilateral blur, fog, and downsampling/upsampling for enhanced performance for the point light inside the cube
- Normal mapping
- Spatial audio
- Catmull-Rom animations

### Controls:

- Exit the default camera animation by pressing “**C**”:
- Move freely using the **WASD keys** and the **mouse**.
- Reenter the camera animation by pressing “**C**” again.

## Libraries and Resources

### Libraries:

- **Assimp** for model loading.
- **GLFW** for handling the window and input.
- **stb\_image.h** for image loading.
- **OpenAL** for audio implementation.

### Textures:

- **Cave floor:** Dirt texture from Polyhaven
- **Cave walls:** Lichen Rock texture from Polyhaven

### Music:

- *The Last Mystery.wav* by X3nus – Download here – Licensed under Attribution 4.0