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Auroral Spectrum Visualization

Not all light is equal. White light can be broken up into millions of colors. When visible light is split up the entire color spectrum can be observed. Understanding the complex variations of sunlight as both a solar phenomenon and a power source is key to global sustainability issues. Understanding the harmful effects of artificial light pollution is equally key.

This piece was inspired by the Aurora Australis and Borealis phenomenon that occurs in the North and South Pole. The Lights are a result of a scientific process where electrically charged particles from the sun collide with each other as they enter the earths atmosphere. The Aurora is sort of a scientific visualisation in real life. The phenomenon is a direct result of natural conditions. Visualisation in science and art is to try and find a balance between visualising something in an aesthetic sense while still maintaining a connection with the science behind it. The auroral phenomenon is sort of natures way of doing this.

Auroral Spectrum is an immersive 3D visualisation that compares the most light polluted place on earth with the least. The sharp contrast of Hong Kong in comparison with Antarctica provides with an interesting difference to draw. The software compares the data and the values are used to effect the particles in the visualisation. The particles themselves are 3D objects in 3D space pre-rendered for the animation. They can behave according to external effects such as turbulence and boid algorithms and these algorithms are completely controlled through scripting and drivers.

A Spectrometer was used to collect wavelength and light intensity values from both Hong Kong and Antarctica. The numbers were processed using a custom software I wrote with python and then fed into a controller mechanism in the Open Source 3D software Blender that then drives a mesh which acts as an emitter for particles. The materials for the particles are also driven by the program. Images from Hong Kong and Antarctica are projected onto the particles in 3D and their visibility is driven by the data. This gives some visual cues to the audience about what is going on as they can occasionally see familiar images come together in the visualisation and then quickly disappear. This serves to give a bridge between the data and prevents it from being just a glorified graph without becoming too literal.

Auroral Spectrum tries to evoke a feeling of a sense of wonder in the audience causing them to wonder how these forms are being created. The immersive experience submerges the viewer in a wonderful spectacle. It brings to light how far from perfection we are in terms of the light situation in Hong Kong.