Scientific Visualization

Summer Semester 2025

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Programming 1 – Skybox & Textures

Initially, the scene contains two spheres. The goal of this exercise is to add a skymap around the scene andf to visualize the Sun and Earth using textures.

Task 1: Skybox (2 Pts)

- Create a file named `stars.hpp` in your source folder. If you are using our recommended Visual Studio setup, you have to do this outside of Visual Studio and run CMake Configure and Generate again.

- Create the class `Stars` in the file `stars.hpp`.

- Add member variables to store a `vtkTexture` and a `vtkSkybox`.

- Load the image `panorama_image.png` using the `vtkImageReader2Factory` in the constructor of your class.

- Create an instance of `vtkTexture` and assign the image in the constructor of your class.

- Create an instance of `vtkSkybox`, assign the texture, and set the projection to sphere in the constructor of your class.

- Create an `InitRenderer` member function in your class, which receives a `vtkRenderer` (see other files for examples). In this member function, add your `vtkSkyBox` to the `vtkRenderer`.

- Add your class to the `scene.hpp`, create an instance of your class and call `InitRenderer`.

Solution:
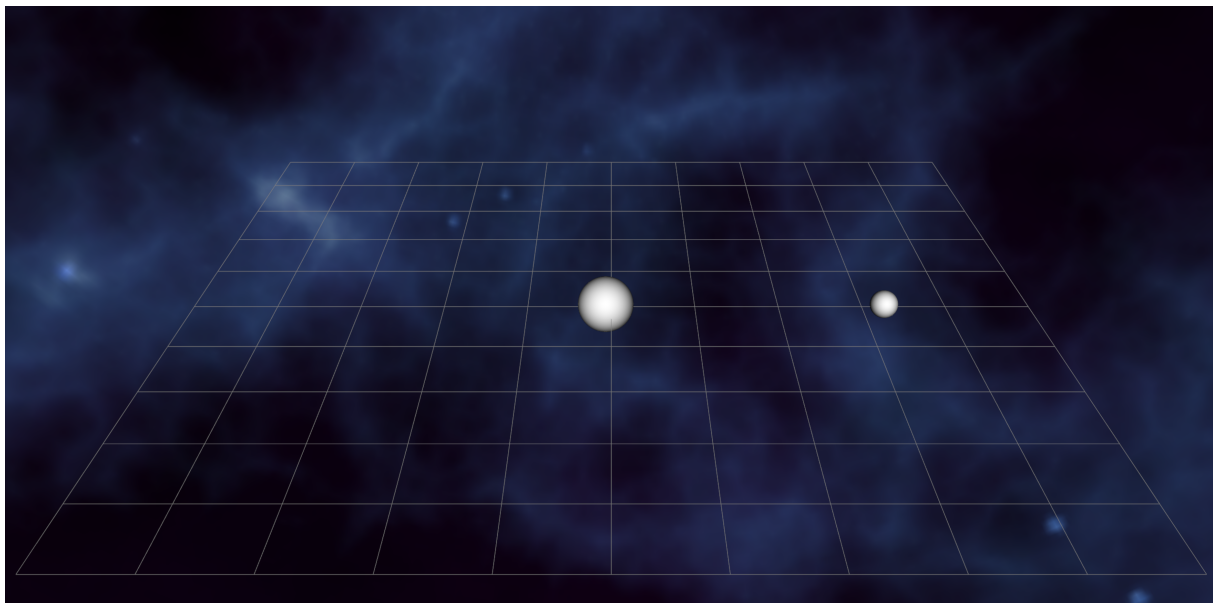
Task 2: Texturing (2 Pts)

- Open the `earth.hpp` to make changes in its constructor.

- Change the `vtkSphereSource` to a `vtkTexturedSphereSource`.

- Load the image `earth.jpg` using a `vtkJPEGReader`.

- Create a `vtkTexture` and set the loaded image as input.

- Assign the texture to the actor.

- Do the same in the file `sun.hpp`.

Solution: