Project 3: WebGL 3D Project

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This project started out using diskworld-2.html as a basis, and therefore much of the code and associated comments are copied from it. After tinkering with the file for a bit, I started to get an idea for what kind of scene I wanted to make. When I saw the way the "sun" moved around the scene and the lighting changed with it, I got the idea to make an Atom with the electrons being the light. I found WebGL's syntax to be a bit more complicated to understand than Three.js' but I eventually got a decent grasp of it. One hurdle I encountered was figuring out how to stagger the protons and neutrons that make up the core. The most difficult hurdle was working out how to make the two electrons that don't move on simply the x and y axis revolve correctly on their associated ring. It took a quite a few trials and errors, but I eventually got it working. The only problem I was not able to solve was how the electrons teleport around the ring when increasing their speed. I believe this has do to with the program calculating their position relative to the speed, rather than their previous position before the speed increase. Aside from that, everything in the program turned out exactly how I wanted. The model is pretty simple at its core, since the only shapes are spheres and toruses. However, the scene contains a total of 22 different objects (4 toruses and 18 spheres). The test plan in the form of figures showcasing the various components that control the scene (aside from the animated ones) of the assignment starts on the next page.

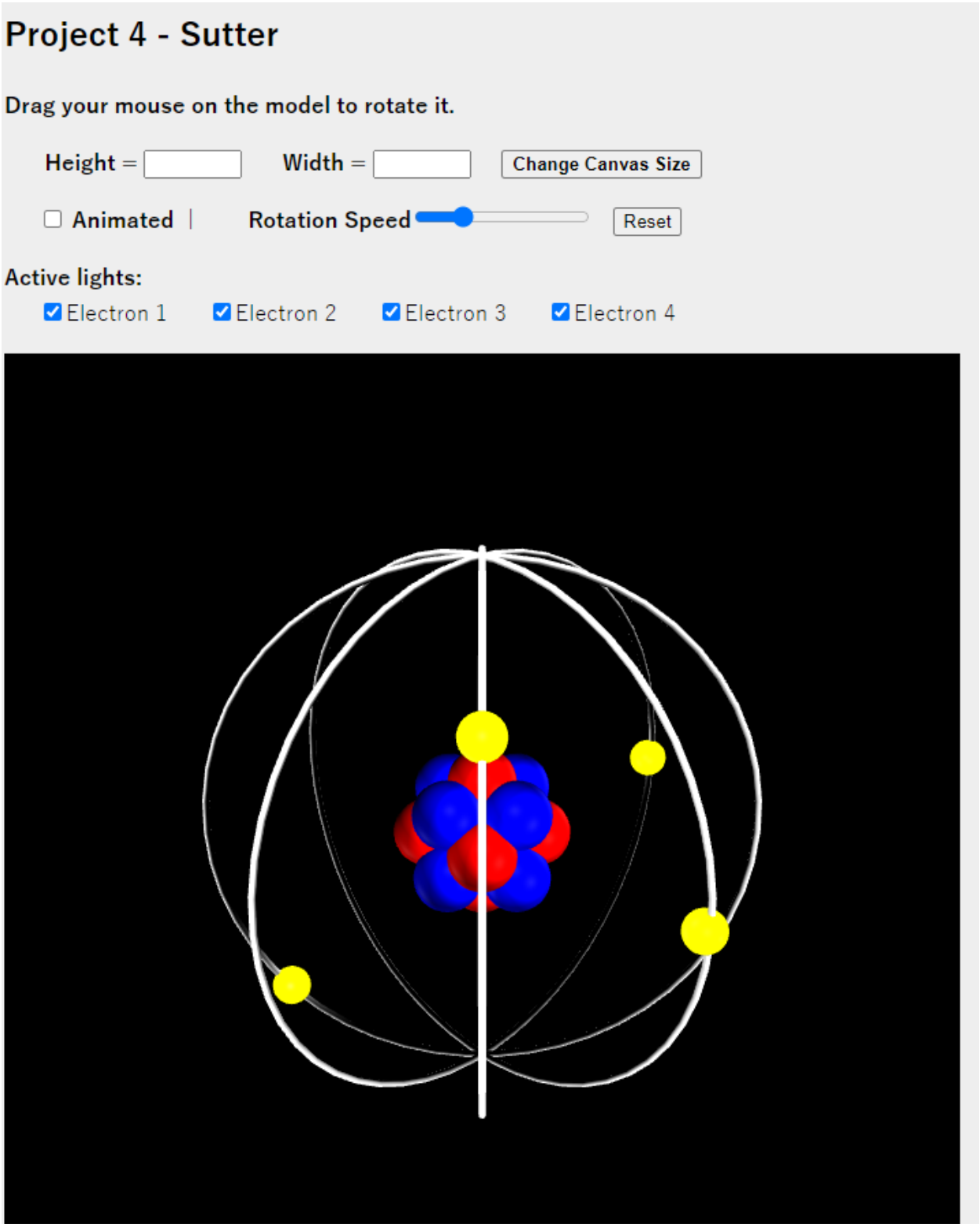

Figure 1. Default starting state of model.

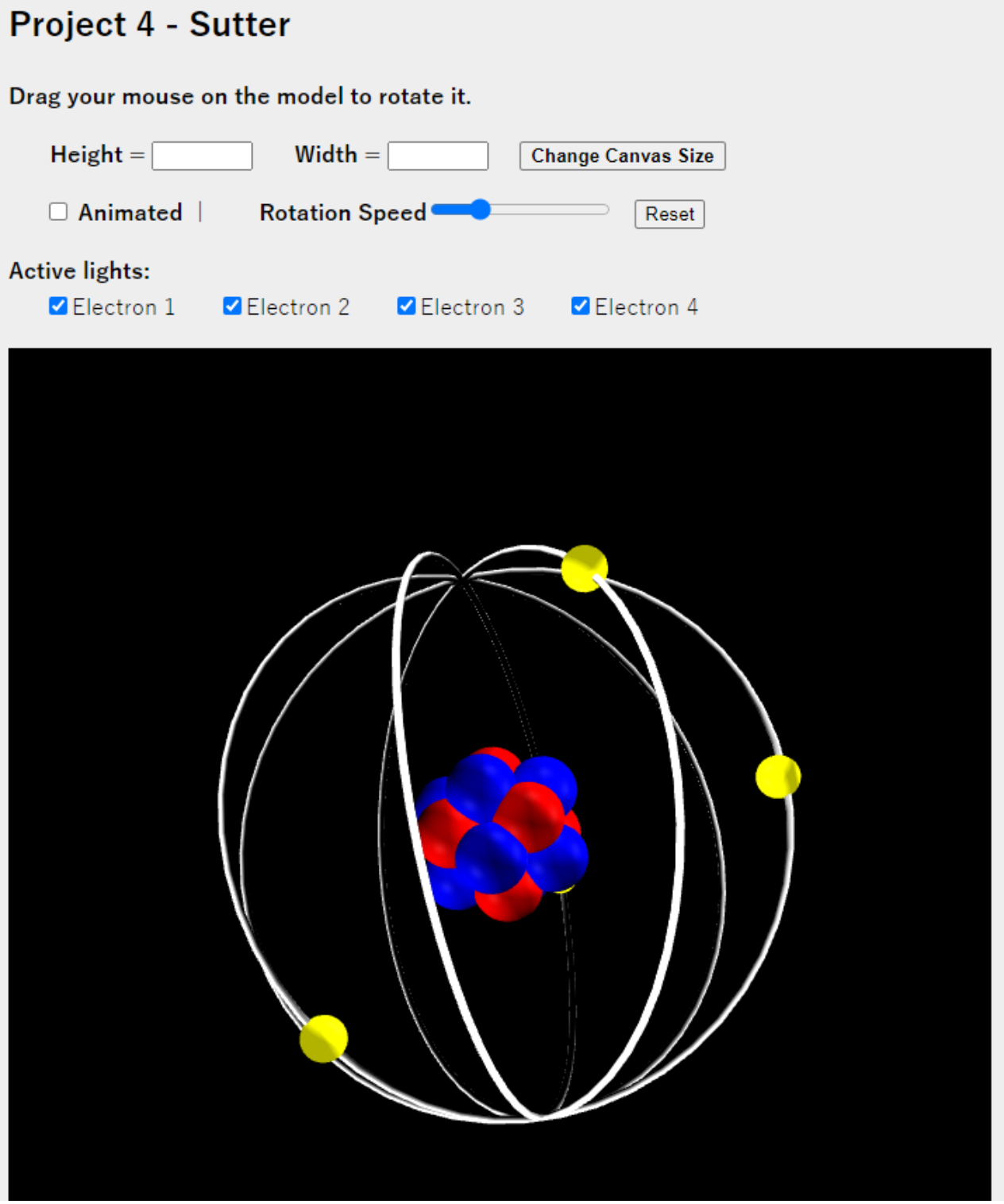

Figure 2. Model rotated with mouse.

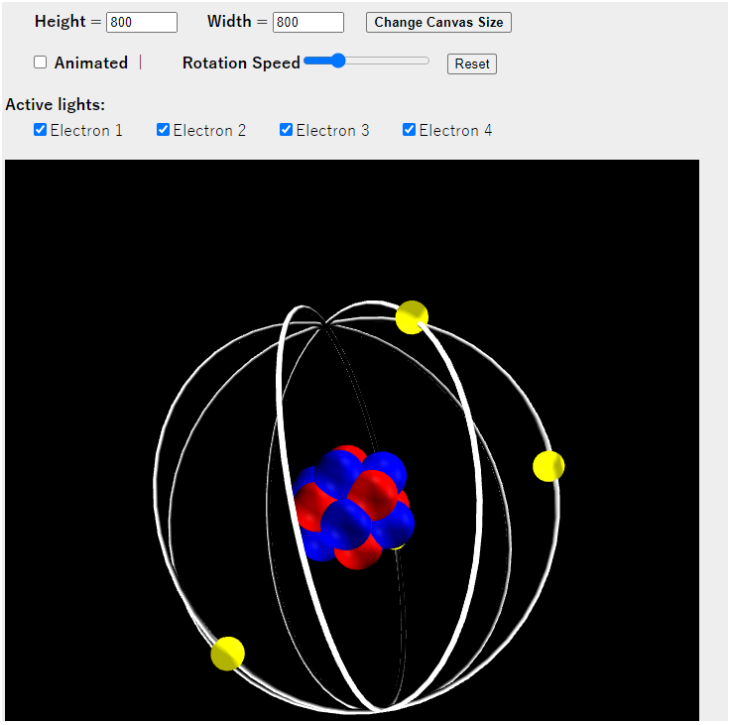

Figure 3. Canvas about to be resized.

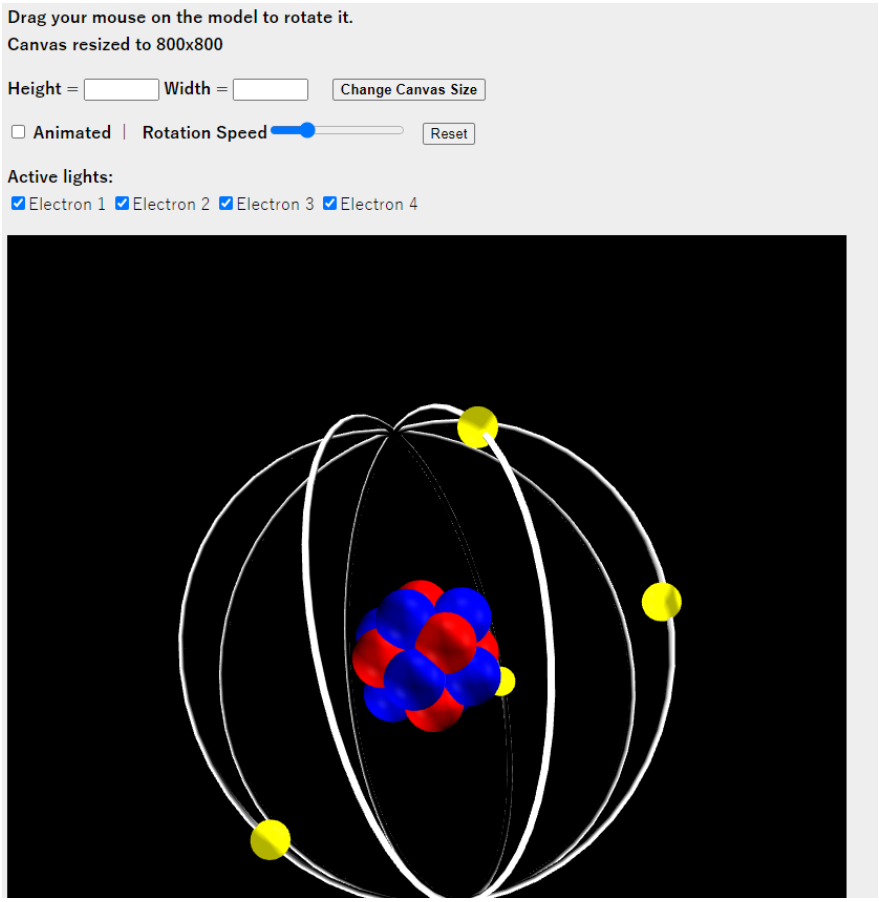

Figure 4. Canvas about to be resized.

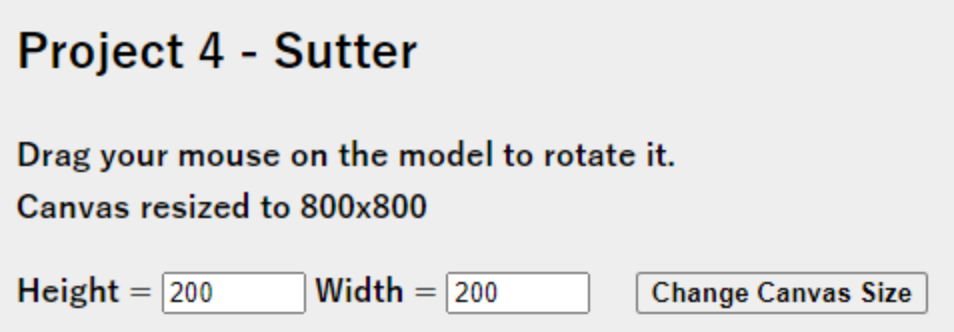

Figure 5. Trying to resize canvas with a low value.

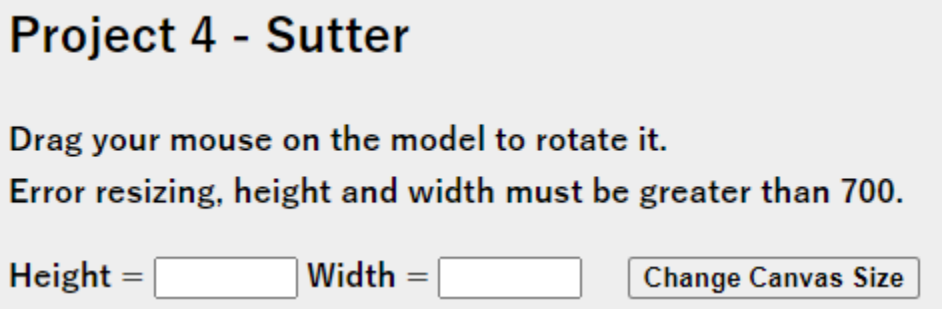

Figure 6. Error message with height and with specifications.

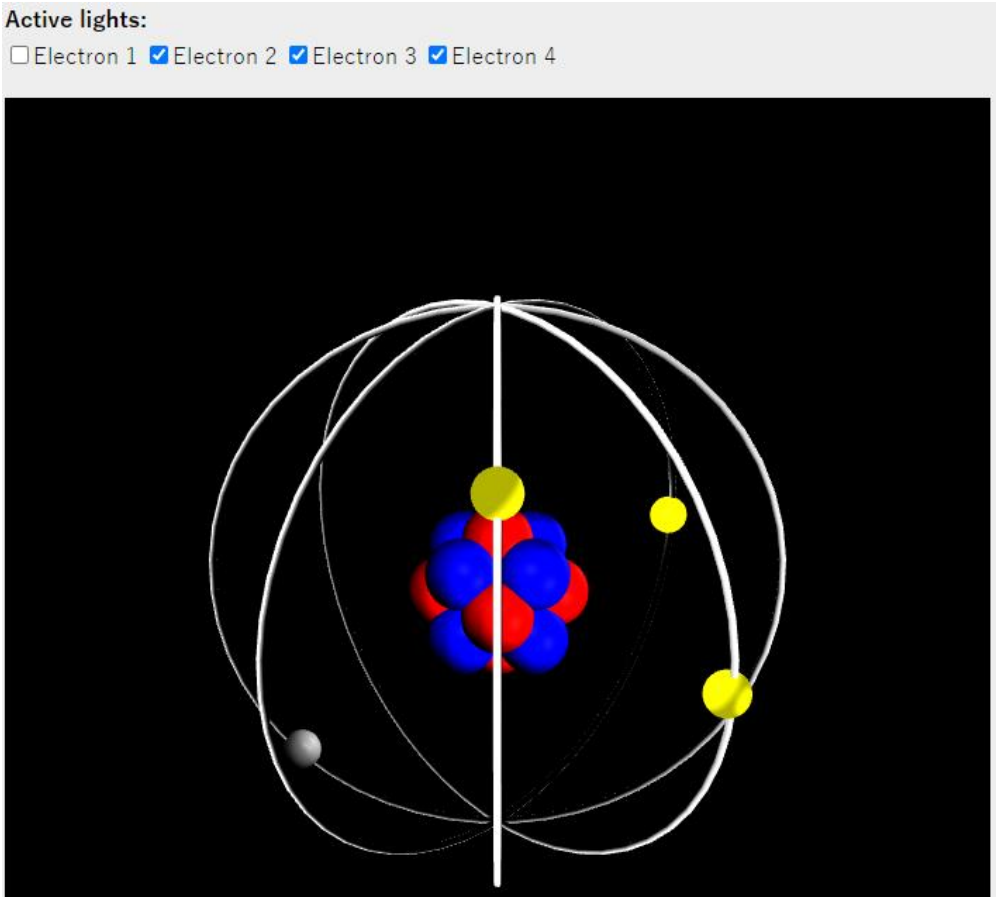

Figure 7. Turning off electron 1 (changes color to gray and turns off light).

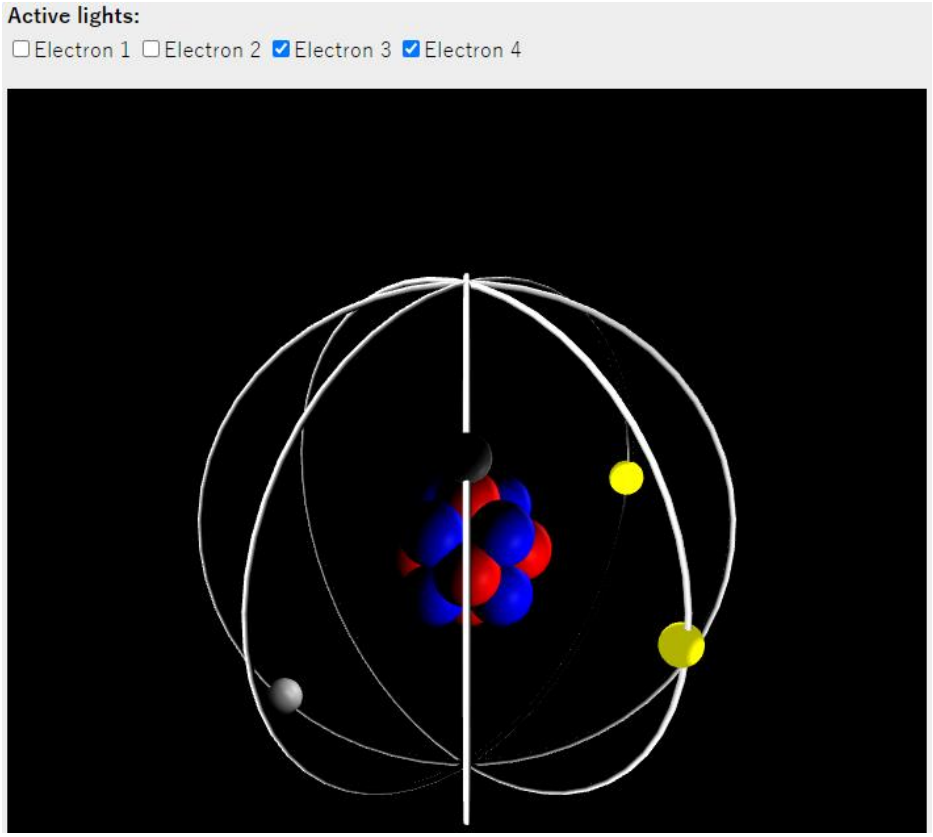

Figure 8. Turning off electron 2.

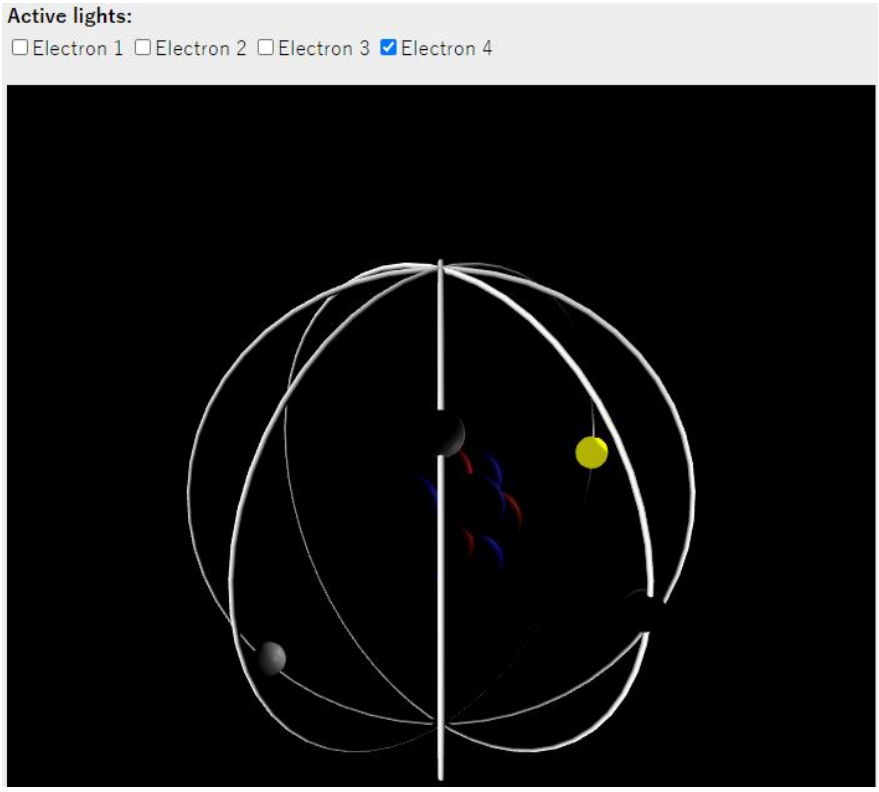

Figure 9. Turning off electron 3.

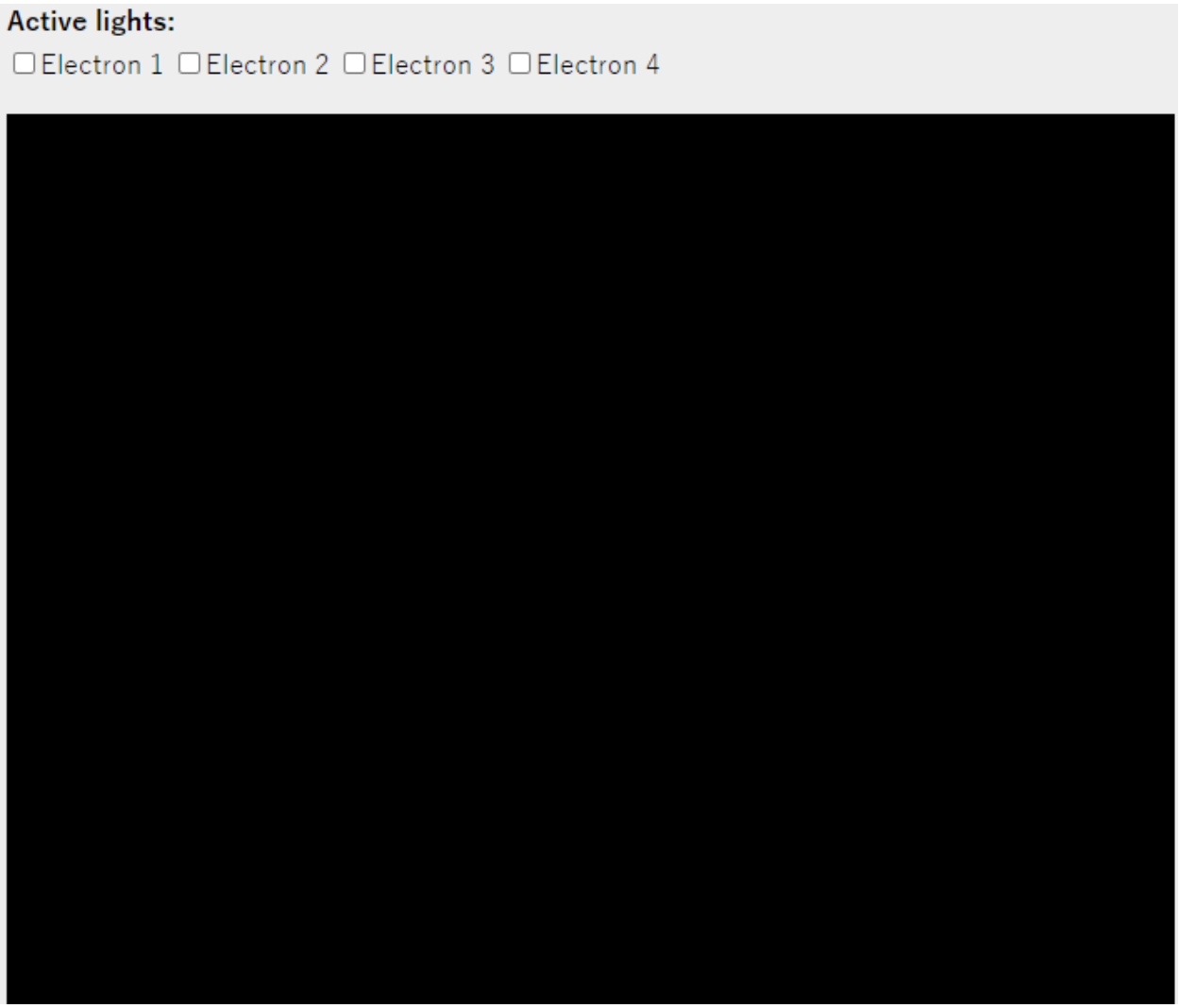

Figure 10. Lightless scene that resulted from turning off electron 4.

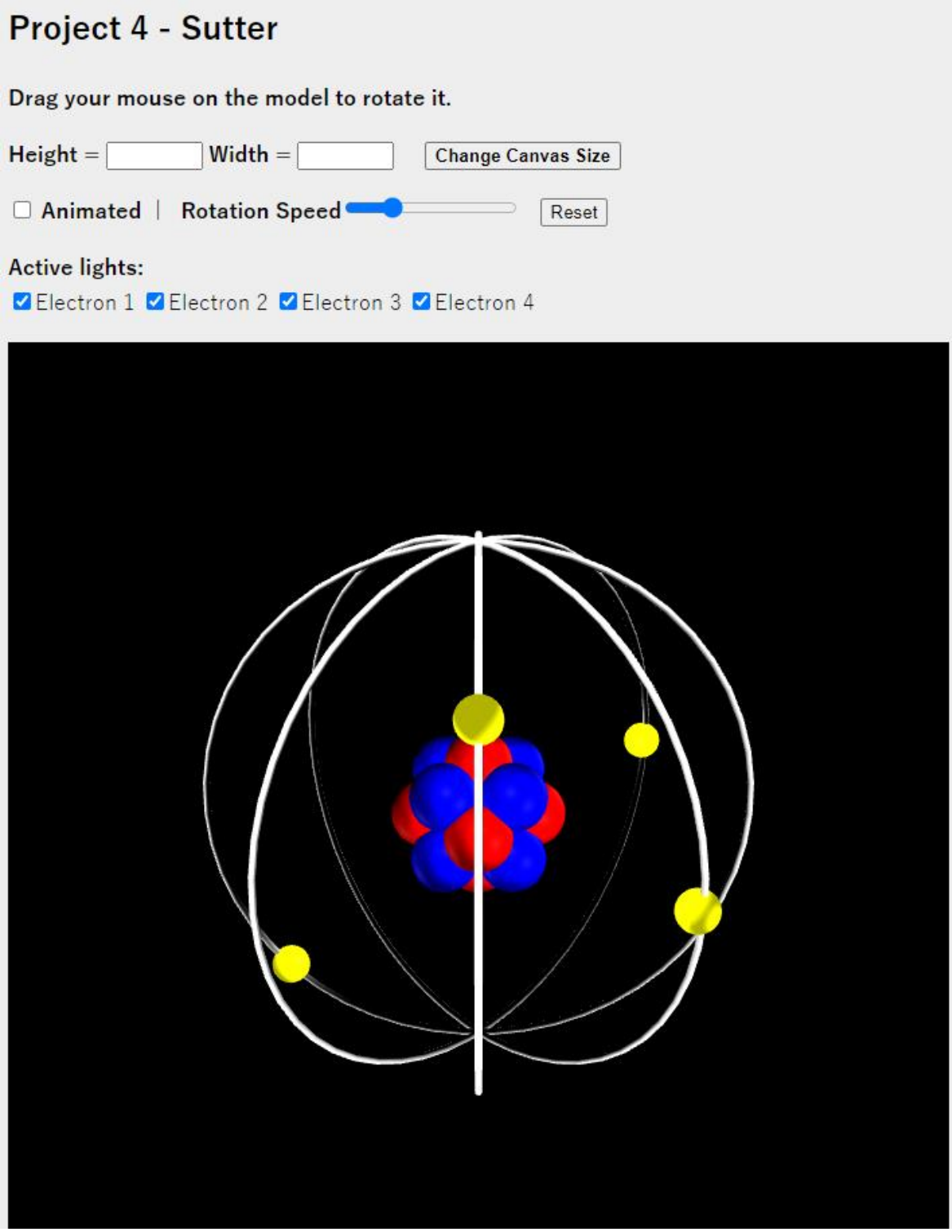

Figure 11. Everything reset after hitting the reset button.

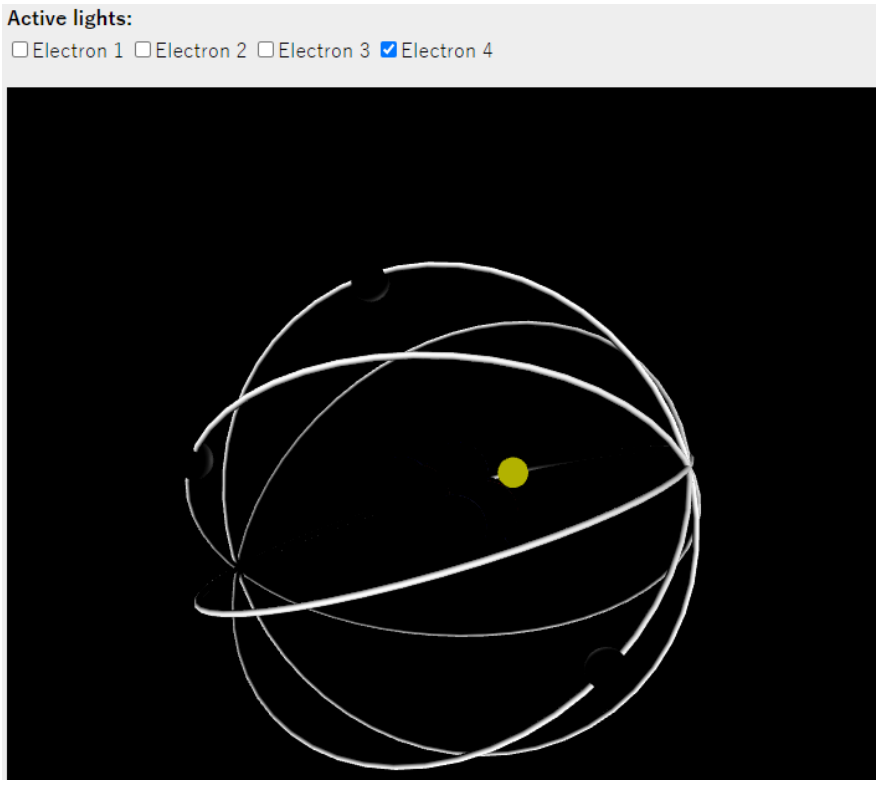

Figure 12. Showcasing how the lights illuminate the scene (bottom of atom core is not lit).

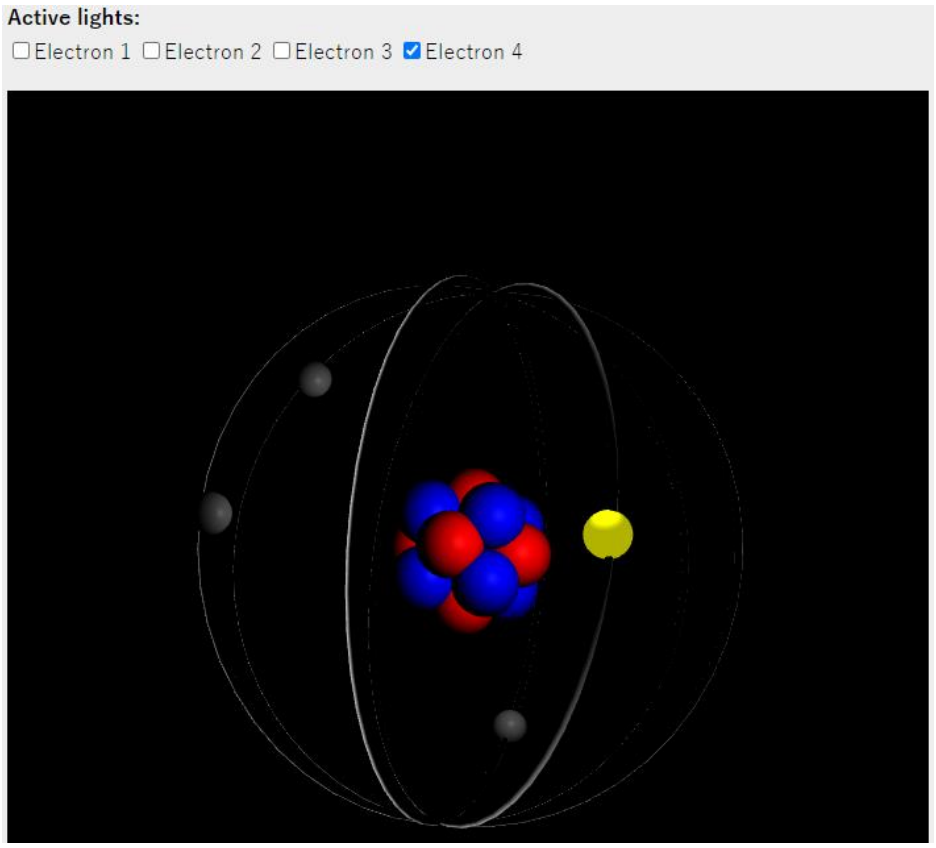

Figure 13. Different angle of figure 12, light illuminates the top of the core.