

## Final Project Proposal

### The Solar System

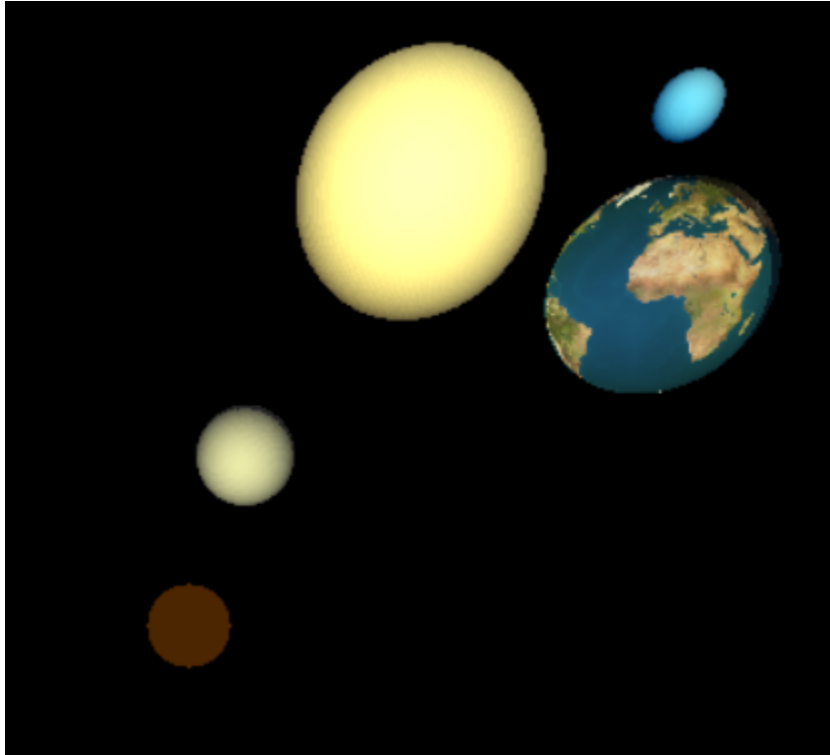
For the final project I will be modeling our solar system with various changes to a to-scale model. The primary change to my model will be that the sun (which will act as a light) will not be to scale with the planets, however the planets themselves will remain properly scaled amongst one another. Furthermore, each planet will also spin around itself (night/day) and be rotated around the sun (years), again proportional to each other's speed. It should also be noted that the elliptical nature of planetary orbits will be ignored in this model, as it is not a drastically important ellipsis size. Lastly, the planets will have differing textures to clarify the rotation of each one.

### The Complete Project

To begin this project some information needed to be gathered pertaining the sizes, orbital periods, and distance from the sun for each of the planets. With that information each planet was made in scale with each other in terms of each of the aspects mentioned above. The exception to this was the sun, which would have taken up too much space for this project.

	Size	Distance from Sun	Orbital Period (speed)
Mercury	0.39	0.39	4.150
Venus	0.96	0.72	1.620
Earth	1.00	1.00	1.000
Mars	0.54	1.52	0.530
Jupiter	11.07	5.20	0.084
Saturn	9.22	9.54	0.034

Uranus	4.01	19.20	0.012
Neptune	3.90	30.06	0.006

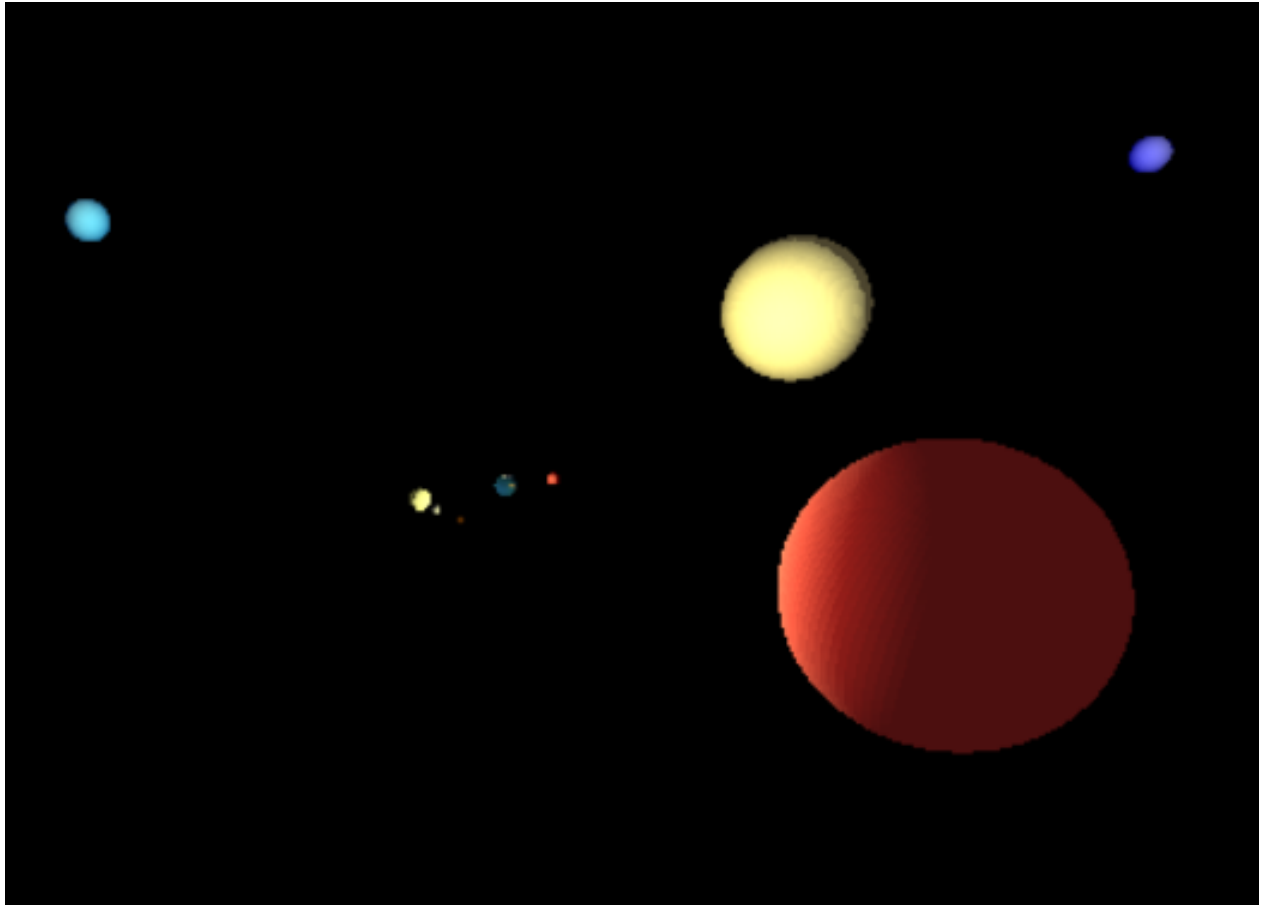


As you can see, the bottom-left sphere, “the sun”, is much smaller than it would be in a to-scale model.

Further explaining the scaling method used, Earth was the base for each planet, meaning that the size, distance, and speed were all calculated as percentages of Earths. An example of this would be how Mars is roughly half the size of Earth, meaning that whatever size Earth was in the simulation, Mars would always be roughly half that size.

It should be mentioned that the size of planets and the distances between them are uncorrelated. The distances were decided arbitrarily, focused entirely on the purpose of fitting each planet onto the viewport.

Lastly, the only part different from the original plan is the rotational periods, or rather “days” for each of the planets. Doing this properly in any capacity would have either the orbital periods or rotational periods be way too slow or fast respectively. For that function, the original idea was scrapped and had to settle for having the rotational periods be much slower than realistically scaled. Aside from that, the rotations are still present to show some level of realism, even if drastically reduced.



A view of the project, showing off the scaling for size and distance.

Link to the video:

[https://media.oregonstate.edu/media/t/1\\_ww1z257k](https://media.oregonstate.edu/media/t/1_ww1z257k)