Poster Project Individual Section

The poster project which I took part in the creation of was a poster called ‘A Conservation Conversation’, and as one would expect, it dealt with conservation laws in physics, as well as their origins from spatial symmetries in reality.

My role in the project was in writing my section, on collisions and dissipation, and assisting in the writing of the central section on Noether’s theorem and general designing of the poster.

While writing my section, I learned quite a bit about dissipation in collisions, and its uses. I read and referenced parts of an interesting paper ‘Transient sound radiated by spheres undergoing an elastic collision’, written by L. L. Koss and R. J. Alfredson. The paper, which theoretically and experimentally analyses the sound radiated by two colliding metal spheres, contained a large amount of palatable, well-explained information explaining the steps taken. I learned about the Hertzian force, some rather complicated acoustic theory, and a somewhat well-timed section on fourier expansion, which we have recently done ourselves. Dissipation in collisions is a physical occurrence used in many facets of engineering and physics. The example which I wrote and learned about was dissipation in collisions between neutrons and moderators in nuclear reactors. Usually, nuclear reactors use water, solid graphite or heavy water (Deuterium). I learned about how moderators work, by slowing neutrons to thermal velocities, and why these specific moderators are efficient, as the atoms of the moderator must have similar size to the neutrons for efficient slowing of neutrons, therefore water is an obvious choice.

In the section on Noether’s theorem, which we recently covered in Advanced Classical Mechanics 1, I didn’t learn a lot of new material, but instead got a more physical insight into its relation to conservation laws, and a slightly better understanding of it’s origin. While it was hard to shorten the proof of the theorem to such a short section, we felt that it contained enough information to explain well the theory behind it.

Finally, in my work in designing the paper I learned about what others in my group had written on, as well as the inefficacy, inadequacy of Microsoft PowerPoint as a platform for poster design. The sections which I found most interesting were the ones on black holes and on the Wu experiment and the violation of the conservation of parity. Black holes themselves are always an interesting topic but I thought that the section was well thought out, concisely explaining what could be considered a difficult topic. The Wu experiment and the violation of conservation of parity was most interesting to me due to both my own interest in particle physics, and the fact that I’d never heard about that topic before. Even parity is a term I’d only come across a few times before our initial search for topics in conservation, but now, is a topic I feel like understand decently well, solely due to the section in this poster.

To conclude, I would say that I thoroughly enjoyed my role in the project, and felt I both contributed and learned significantly, as I’m sure all of my group did.