

General Research Notes

Math Expressions

$\sqrt{\frac{1}{2}}$

Blocks

Code Block

Electrons Wave-Particle Duality and Superposition

- The electron itself is a particle but it moves like a wave.
- Because of superposition, the electron and its wave are in multiple positions at the same time.
- This is why when only one electron is shot through the double slits, two electrons end up going through the slits, one per slit, at the same time (because of superposition).
- Since two electrons are going through the slit at the same time, and electrons also act as a wave, both deconstructive and constructive interference happens which forms a pattern on the screen.
- Almost anything can be in a superposition of states. This includes, neutrons, protons, quarks, and even cats! Although in order for a cat to be in a superposition of states, we would have to observe it at a microscopic level (aka. shrink the cat to the size of an electron and view it).
- It was the double slit experiment with electrons that proved that electrons are both waves and particles. This experiment also proved superposition because the electron didn't go just through one slit, instead, it went through both. (the electron's superposition were in front of the other slit)