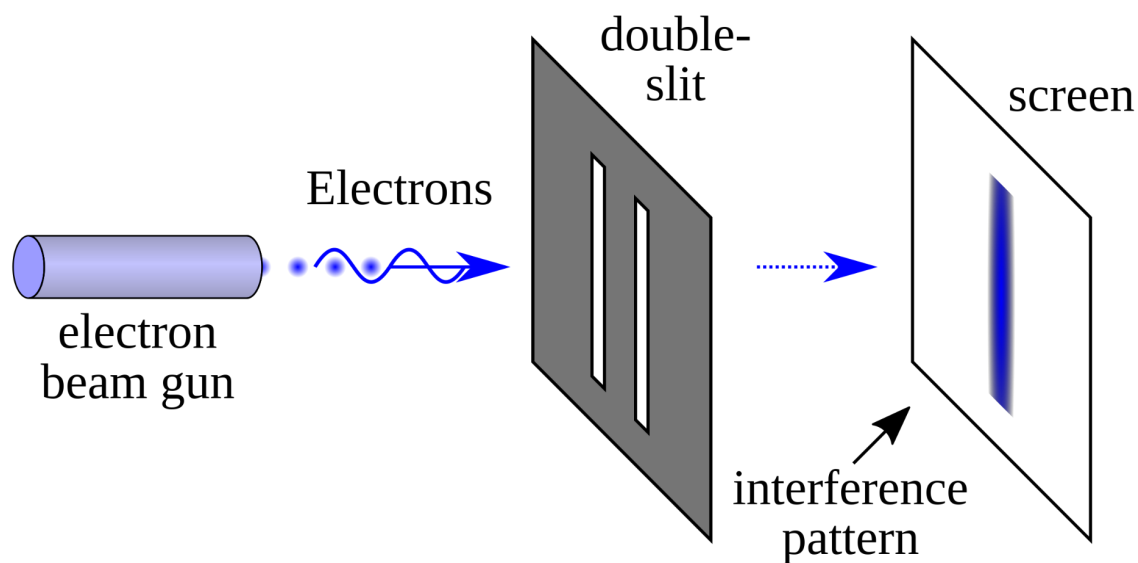


Double Slit Experiment:

Imagine having a piece of metal and that piece of metal has a slit in the middle. If you throw an object through the slit you can imagine what would happen. The object will pass through the slit. Now imagine having two parallel slits on a piece of metal and you throw an object at one of the slits and another object at the other slit. What will happen? What about throwing objects multiple times? What will happen? You might think the objects will pass through and end up at the other end of the slit it passed through. However, in this experiment it passes through the slits and caused an interference in the middle at the other end. An interference is when 2 objects or matters of the same wavelength and phase join together or the same wavelength with 180 degree phases cancel each other out. This is because of the nature of the wave. However, they show up at the other end as particles and not waves even though particles do not cause interference. The matters at the other end end up having different densities even though the particles thrown were of the same density. Here is an illustration using electrons. There are two electron beam guns but for the purposes of illustration only one is shown.



(By Original: NekoJaNekoJa Vector: Johannes Kalliauer - File:Double-slit.PNG, CC BY-SA 4.0, <https://commons.wikimedia.org/w/index.php?curid=61496401>)

This is the experiment that gave us wave-particle duality which says that matter can be described as a particle or a wave. It also gave us the ability to use it in quantum computing with something called superposition.