De Broglie & Matter Waves

Since Compton proposed that waves can act like particles, de Broglie suggested perhaps matter can be described as a wave.

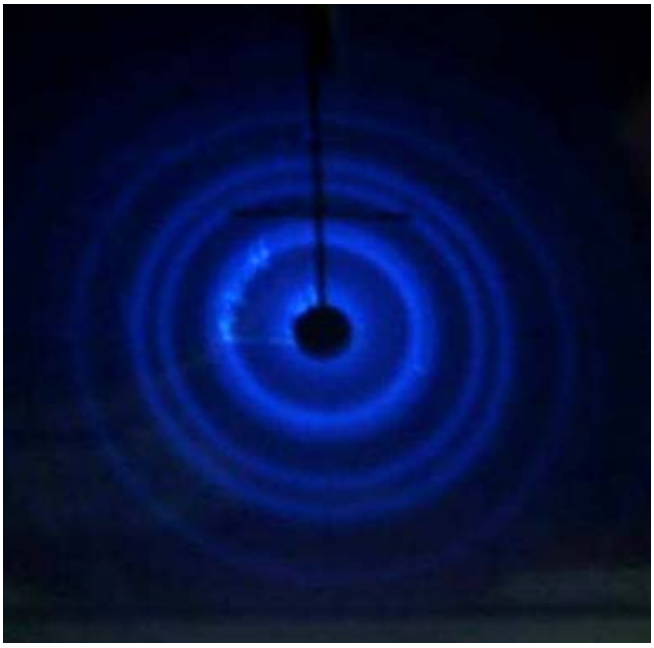
He uses the same equation. The idea was so radical at the time that his graduation was held up for one year. He graduated in 1924 and won the Nobel Prize in 1929.

Electron Diffraction

http://www.youtube.com/watch?v=i0xMgsnmE4Y&feature=related

http://www.youtube.com/watch?v=vCRNGqXBPRk&feature=related

** Electron diffraction is more proof that electrons can act as a wave.



1. What is the de Broglie wavelength of an electron that has been accelerated from rest to a velocity of 4.8×10^{6} m/s?

2. Calculate the de Broglie wavelength of a proton moving at 5.0×10^{4} m/s.

All matter, baseballs, humans and cats named Spot, can be thought of as having a wavelength, but it is so incredibly small that it is not noticeable.

3. Calculate the de Broglie wavelength of a 2.0 kg baseball moving at 15m/s.

4. What is the de Broglie wavelength of a 1000 kg car moving at 90 km/h?