EINSTEIN 1906

Corpuscular-wave dualism for photons. Explanation of the photoelectric effect using the quantum hypothesis of Planck. Nobel prize to A. Einstein awarded in 1921 “for services to Theoretical Physics, and especially of the law of the photoelectric effect.”


A. Einstein
Annalen der Physik. Leipzig 20 (1906) 199;

Reprinted in

DAVISSON 1927

Experimental evidence that the electron moves as a group of de Broglie waves. Nobel Prize to C. J. Davisson awarded in 1937 and to co-winner G. P. Thomson “for their experimental discovery of the diffraction of electrons by crystals.”

The Scattering of Electrons by a Single Crystal of Nickel

C. J. Davisson, L.H. Germer
Nature 119 (1927) 558;

Excerpt In a series of experiments now in progress, we are directing a narrow beam of electrons normally against a target cut from a single crystal of nickel, and are measuring the intensity of scattering (number of electrons per unit solid angle with speeds near that of the bombarding electrons) in various directions in front of the target. The experimental arrangement is such that the intensity of scattering can be measured in any latitude from the equator (plane of the target) to within 20° of the pole (incident beam) and in any azimuth. . . .

. . . If the incident electron beam were replaced by a beam of monochromatic X rays of adjustable wave length, very similar phenomena would, of course, be observed. . . .

. . . These results are highly suggestive, of course, of the ideas underlying the theory of wave mechanics, and we naturally inquire if the wave length of the X ray beam which we thus associate with a beam of electrons is in fact the $h/mv$ of L. de Broglie. The comparison may be made, as it happens, without assuming a particular correspondence between X ray and electron beams, and without use of the contraction factor.

(Extracted from the introductory part of the paper.)