
Curriculum Vitae Professor Dr Louis-Victor de Broglie

Name: Prince Louis-Victor Pierre Raymond de Broglie

Life Dates: 15 August 1892 - 19 March 1987



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Prince Louis-Victor Pierre Raymond de Broglie was a French physicist who was awarded the Nobel Prize in Physics for discovering the wave-like nature of electrons (wave–particle duality) in 1929.

Academic and Professional Career

Louis-Victor de Broglie originally studied humanities and graduated from Sorbonne University in Paris, France, in the subjects philosophy and history in 1910. Inspired by his older brother, the experimental physicist Maurice de Broglie, he studied mathematics and physics from 1911. In the same year, the first Solvay Conference took place in Brussels, Belgium, and the lectures presented there were published by Maurice de Broglie, which is how Louis-Victor first came into contact with unsolved issues in quantum physics.

During the First World War, de Broglie had to pause his studies. To serve the army, he was stationed at the radio communication post on top of the Eiffel Tower for a while, during which he dedicated himself to study problems in electrical engineering. In 1919, he resumed his studies and started to research x-ray spectroscopy and the photo effect in his brother's laboratory. In 1923, he published his first work on wave mechanics. A year later, he earned his doctorate. His dissertation "Recherches sur la théorie des Quanta" received the attention of quantum physicists from all over the world and his theories were honoured by the Institut de France in 1926.

In 1927, de Broglie took part in the fifth Solvay Conference in Brussels. In 1929, he was appointed professor for theoretical physics at the institute Henri Poincaré in Paris, and lectured at Sorbonne University from 1932 to 1962. After the Second World War, he became a counsellor to the French High Commission of Atomic Energy.

1929 Nobel Prize in Physics

On 25 November 1924, Louis-Victor de Broglie defended his dissertation on quantum theory in Paris. Far away from the three leading centres for the study of quantum theory of that time (Copenhagen, Göttingen and Munich), he developed his thoughts as a student of Henri Poincaré and Paul Langevin. The age-old discussion on whether light had wave or corpuscular properties was sparked once again at that time. It was about understanding the physical phenomena that triggered the movement of electrons within an atom. The Bohr model of the atom shifted the debate of the wave-or-corpuscle question onto the level of electrons. De Broglie answered this question of wave or corpuscle with wave and corpuscle. This so-called wave-particle duality of quantum physics states that objects have the properties of waves as well as of particles. This idea was so novel at that time, that during his dissertation defence, de Broglie was asked by a member of the exam committee how he intended to prove the existence of matter waves in an experiment. De Broglie suggested firing a beam of electrons at a small opening, expecting to make the same observations as when shooting rays of light.

The exam committee, including physicist Paul Langevin, reacted rather sceptically to his theoretical assumption but accepted his work. Langevin eventually sent de Broglie's dissertation to Albert Einstein, who was rather impressed by it. Even Max Planck later reported: "The boldness of the idea was so extreme – I have to admit, I shook my head at it back then."

Three years later, on 6 January 1927, the physicists Clinton Davisson (Nobel Prize 1937) and Lester Germer were able to observe the diffraction of electrons by a nickel metal crystal. Shortly thereafter, the British physicist George Paget Thomson (Nobel Prize 1937) reproduced the experiment. With this, they all provided evidence for de Broglie's theoretical assumption. Louis-Victor de Broglie was awarded the Nobel Prize in Physics for his work in 1929.

Honours and Awarded Memberships

De Broglie received numerous awards for his scientific work, such as the Henri Poincaré Medal (1929) and the Max Planck Medal (1938).

De Broglie was also a member of numerous scientific academies, such as the Académie des Sciences and the Académie Française, the German National Academy of Sciences Leopoldina (1934) and the Royal Society, UK (1953). He also received an Honorary Doctorate from the Universities of Warsaw, Bucharest, Athens, Lausanne, Québec and Brussels.

About Louis-Victor de Broglie

Prince Louis-Victor Pierre Raymond de Broglie was born on 15 August 1892 as the fourth child of Louis-Alphonse-Victor de Broglie, the 5th duc de Broglie, and his wife Pauline d'Armaillé, born in Dieppe, Normandy, France. He attended the Lycée Janson de Sailly in Paris. His older brother was the experimental physicist Maurice de Broglie. After his father's death in 1906, Maurice looked after his brother Louis-Victor, who was 17 years younger.

Since Maurice's only child prematurely died and he did not have any other descendants, Louis-Victor inherited the title of duke in 1960. Louis-Victor de Broglie died on 19 March 1987 in Louveciennes near Paris.