



FZU

Institute of Physics
of the Czech
Academy of Sciences

Invitation

to the seminar of Division of Elementary Particle Physics of the
Institute of Physics of the Czech Academy of Sciences



Jiří Chýla

Institute of Physics
of the Czech Academy of Sciences

The Centenary of wave-particle duality and birth of Quantum Mechanics

Abstract: On 25th November 1924 Louis de Broglie defended his *Thesis Recherches sur la Théorie des Quanta*, in which he extended the concept of wave-particle duality developed by Einstein for the description of the behaviour of the photon to massive particles, like the electron. His Thesis started rapid development of the Wave Mechanics, one approach to emerging Quantum mechanics, by Erwin Schrödinger in 1926. Independently and unrelated to de Broglie hypothesis, Heisenberg with Born and Jordan developed in 1925 the Matrix Mechanics, which Schrödinger showed in March 1926 to be equivalent to his Wave Mechanics.

I will sketch the difficult life of Einstein's idea, the last attempt of Bohr, Kramers and Slater to save classical physics for the description of atomic phenomena and key role played by Compton experiments with scattering of X-rays on electrons for the final acceptance of the Einstein conception of the photon. I will emphasize the influence of de Broglie idea of matter waves on Schrödinger and will show that Schrödinger adopted it, but chose its completely different realization based on Hamilton-Jacobi equation of classical physics. I will recall that the final confirmation of the physical relevance of de Broglie's idea of matter waves came from diffraction experiments of Davisson and Germer with electrons. And I will close with the subtle question of interpretation of matter waves by Max Born.

When: Thursday, November 28, 2024 at 2PM

Where: Dvořák hall, FZU, Pod Vodárenskou věží 1, Prague

For more information, please see <https://indico.fzu.cz/event/265/>