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Neutrino mysteries (Part I, Oscillations)

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After the latest experimental results, neutrino physics became a very exciting subject and took a very rapid expansion. Neutrino, the most elusive elementary particle has always reserved surprises to theorists and experimentalists. Its existence has been predicted by W. Pauli in 1930, at a moment where only the electron and proton were known, in order to save the energy conservation low. Due to the very weak interaction with matter, only 26 years later the first neutrino has been detected.
In the first part of this lecture, a neutrino historical review will be given. In the second part, the relation between the Standard Model (particle theory) and the oscillation formalism will be introduced. The third part will be devoted to the experimental results extracted from the most representative experiments. In the last part, new projects proposed for a better understanding of neutrino properties will be presented.

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