

Spontaneous parity violation

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Parity as prime example of left-right symmetry, is at the core of discrete symmetries, the first one that a child sees. It has played a fundamental role in the development of weak interactions, first with the V-A effective theory and then in the construction of the Standard Model. I show first how the maximal breaking of parity in beta decay was crucial in Weinberg's classic 1967 paper that completed the SM. I then turn to the idea of spontaneous symmetry breaking of parity in the context of the Left-Right Symmetric Model (LRSM) which led originally to neutrino mass and the seesaw mechanism behind its smallness. I discuss finally how over the years, the LRSM turned into a self-contained, predictive theory of neutrino mass, in complete analogy with the SM as a theory of charged fermion masses.

Author: SENJANOVIC , Goran (LMU)

Presenter: SENJANOVIC , Goran (LMU)

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