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Particle Physics of Non-Standard Neutrinoless Double Beta Decay

Thursday, May 30, 2019 9:00 AM (30 minutes)

The talk will focus on the effective description of exotic neutrinoless double beta decay and the implications of its hypothetical observation. Particular attention will be paid to the short-range mechanisms, which, being represented at low energies by 9-dimensional effective operators, implicitly assume the existence of some underlying new heavy degrees of freedom. The microscopic description of neutrinoless double beta decay including a thorough calculation of relevant nuclear matrix elements and phase-space factors allows for the estimation of the corresponding effective couplings and it can also help to pinpoint the dominant mechanism. Moreover, as the low-energy neutrinoless-double-beta-decay-contributing operators can be encoded in terms of the Standard Model effective operators violating lepton number by two units, it is possible to study the interplay between lepton number violation at high and low energy scales. Specifically, the contribution of the SM effective operators to the rate of neutrinoless double beta decay can be correlated with the washout of lepton number induced by the same operators in the early universe, and thus potentially constrain mechanisms of high-scale baryogenesis.

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Session Classification: Session (Chair: M. Hirsch)