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Higgs doublet decay as the origin of the baryon asymmetry

Monday, September 12, 2016 3:00 PM (20 minutes)

In this talk I will start by considering a question which curiously had not been properly considered so far: in the standard seesaw model what is the minimum value the mass of a right-handed (RH) neutrino must have for allowing successful leptogenesis via CP-violating decays? I show that, for low RH neutrino masses and thanks to thermal effects, leptogenesis turns out to proceed efficiently from the decay of the Standard Model scalar doublet components into a RH neutrino and a lepton. If the RH neutrino has thermalized prior from producing the asymmetry, this mechanism turns out to lead to the bound mN>2 GeV. If, instead, the RH neutrinos have not thermalized, leptogenesis from these decays is enhanced further and can be easily successful, even at lower scales. This Higgs-decay leptogenesis new mechanism works without requiring an interplay of flavor effects and/or cancellations of large Yukawa couplings in the neutrino mass matrix. Last but not least, such a scenario turns out to be testable, from direct production of the RH neutrino(s).

Summary

Presenter: Dr TERESI, Daniele (Université Libre de Bruxelles)

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