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The hierarchy problem in non-supersymmetric extended models

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Efforts building models of Grand Unification have overwhelmingly been within the framework of Supersymmetry, since it provides the dual benefit of a solution to the hierarchy problem and gauge coupling unification. Any non-supersymmetric model of Grand Unification must necessarily include an alternative solution to the hierarchy problem. In this talk, I will discuss mechanisms such as asymptotic safety and the multiple point principle that provide interesting high scale boundary conditions on the Higgs quartic coupling leading to the prediction of the light Higgs boson. I will review the well known predictions within the Standard Model and describe new work on extended Higgs sectors and the predictions that such boundary conditions enforce. I will also look forward to how these ideas may be used in the construction of a believable non-supersymmetric Grand Unified Theory.

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