

Natural Supersymmetry and the Twin Higgs Mechanism

M. Badziak

*Institut Fizyki Teoretycznej,
Wydział Fizyki, Uniwersytet Warszawski,
ul. Pasteura 5, 02-093 Warszawa*

Supersymmetry (SUSY) provides the most appealing solution to the hierarchy problem of the Standard Model (SM). It is a common lore that SUSY particles must have masses around the electroweak (EW) scale to solve this problem. I will present SUSY models with the so-called Twin Higgs mechanism implemented allowing for masses of SUSY particles in a few-TeV range without conflict with the naturalness of the EW scale. Such models have a discrete symmetry for which each SM particle and its SUSY partner have a corresponding state that transforms under a mirror (twin) SM gauge group. SUSY particles in this framework may be beyond the discovery reach of the LHC. On the other hand, there are many interesting cosmological signatures of this class of models including new candidates for dark matter, mechanisms generating baryon asymmetry in the Universe, and the existence of new light particles contributing to the effective number of neutrinos which will be tested in the near future.