



東北大学 宇宙創成物理学国際共同大学院プログラム

GP-PU (Graduate Program on Physics for the Universe) Seminar セミナー

“Supersymmetry confronted with dark matter and muon $g-2$ ”

by Jin-Min Yang

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Time and Date : 16:00 - 18:00, Thu December 19th 2019

Venue : Room 745, Science Complex B (H-03)

Abstract:

This lecture contains two parts. Part one is the basics of supersymmetry (SUSY), which contains a brief description of SUSY history, SUSY algebra, SUSY Lagrangian construction, SUSY breaking and mediations, various SUSY models, SUSY Higgs sector, the virtues of SUSY, and the status of SUSY. Part two is a comprehensive study of SUSY in light of dark matter (DM) and muon $g-2$, in which we confront SUSY with the muon $g-2$ anomaly, the DM relic density, the DM direct detection limits and the latest LHC Run-2 data. The study shows that the sneutrino DM or the neutralino DM with sizable higgsino component has been excluded by the direct detections and then two viable scenarios are pinned down: one has the light compressed bino and sleptons but heavy higgsinos (BHL), and the other has the light compressed bino, winos and sleptons (BWL). From investigating the observability of these SUSY particles in both scenarios at future colliders, it turns out that the HE-LHC with a luminosity of 15 ab^{-1} can exclude the whole BHL scenario and most part of BWL scenario at 2σ level. The precision measurement of the Higgs couplings at the lepton colliders (either ILC or CEPC) could play a complementary role of probing these SUSY particles.

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