

FAKULTÄT für PHYSIK
LUDWIG-MAXIMILIANS-UNIVERSITÄT
MÜNCHEN/GARCHING

PHYSIK-DEPARTMENT
TECHNISCHE UNIVERSITÄT MÜNCHEN
MÜNCHEN/GARCHING

MLL-KOLLOQUIUM

Donnerstag, 12.12.2019, 16¹⁵ Uhr

Hörsaal der LMU in Garching, Am Coulombwall 1
Treffen zum gemeinsamen Kaffee 16 Uhr

Dr. Zinonas Zinonos

(Max-Planck-Institut für Physik, München)

Search for Supersymmetry in Multi-Lepton and Tau Final States with the ATLAS Detector at the LHC

Supersymmetry (SUSY) is the most appealing and searched extension of the Standard Model as it elegantly provides solutions to most of the major concerns in particle physics: the hierarchy problem, the gauge coupling unification and the dark matter mystery. SUSY is also motivated by solutions to several theoretical problems, such as supergravity, the theory of everything and the explanation of the cosmological inflation.

Ten years ago, in November 2009, the Large Hadron Collider (LHC) delivered the first proton-proton collisions at unprecedented center-of-mass energies and collision rates, and hereafter a vast amount of such data have been collected and scrutinized by the LHC experiments. However, the exploration of the LHC data found no evidence for SUSY and, as a result, surpassed existing experimental limits from independent experiments placing thus tight constraints on SUSY parameter space. The large LHC dataset assisted undoubtedly in increasing the sensitivity for colored sparticles and was particularly beneficial for electroweak searches, and for the more difficult final states held by compressed particle spectra, stealth SUSY, long-lived sparticles, and R-parity violating scenarios.

In this talk, the searches for SUSY particles in the electroweak sector will be presented with particular emphasis on event final states with many light leptons and taus. These searches exploit proton-proton collision data delivered by the LHC at a center-of-mass energy of $\sqrt{s} = 13$ TeV, and collected and reconstructed with the ATLAS detector in the years 2015 - 2018. In the absence of any significant deviation above the well-understood background processes as predicted by the Standard Model, upper limits are put on the masses of the SUSY particles involved in R-parity violating and conserving scenarios. A discussion on the expectations regarding the forthcoming LHC data taking period will follow.

gez. Peter Thirolf
Tel. 289-14064

gez. Norbert Kaiser
Tel. 289-12367