T 502 BSM II

Zeit: Donnerstag 16:20–18:40 Raum: P1-02-323

T 502.1 Do 16:20 P1-02-323

What is the Discrete Gauge Symmetry of the MSSM? — •Christoph Luhn — Physikalisches Institut der Universität Bonn, Nußallee 12, 53113 Bonn

We systematically study the extension of the Supersymmetric Standard Model by an anomaly-free discrete gauge symmetry Z_N. We extend the work of Ibáñez and Ross with $N = 2, 3$ to arbitrary values of N. As new fundamental anomaly-free symmetries we find four Z_6, nine Z_9 and nine Z_{18}. If we impose certain phenomenological requirements we are left with two symmetries: baryon-triality B_3 and a new Z_6 symmetry, which we call proton-hexality P_6. This we propose as the discrete gauge symmetry of the MSSM, instead of R-parity.

T 502.2 Do 16:40 P1-02-323

A Low-Energy Froggatt-Nielsen Benchmark Model — •Marc Thormeier — SPhT, CEA-Saclay

We establish a benchmark model for investigating FCNCs and EDMs (especially coming from higher-dimensional superpotential terms) in low-energy Froggatt-Nielsen scenarios, treating the broken flavour symmetry as a generation-dependent U(1)_Z'.

T 502.3 Do 17:00 P1-02-323

Reconstructing the See-saw Mechanism with Leptogenesis and lepton flavor violation — •Werner Rodejohann — TU München

In general the see-saw mechanism to generate light neutrino masses has too many parameters to be completely reconstructed at low energy. In supersymmetric frameworks this situation might change, because lepton flavor violating processes like $\mu \to e\gamma$ depend on the same parameters as neutrino masses. We show how the requirement of successful leptogenesis and the already rather stringent limit on $\mu \to e\gamma$ already put constraints on some SUSY parameters.

T 502.4 Do 17:20 P1-02-323

Constraints on SUSY Seesaw Parameters from Leptogenesis and Lepton Flavor Violation — •Frank Deppisch[1], Heinrich Päs[2], Andreas Redelbach[3], and Reinhold Rückl[4] — [1]Deutsches Elektronen-Synchrotron DESY, D-22603 Hamburg — [2]Department of Physics & Astronomy, University of Hawaii at Manoa, 2505 Correa Road, Honolulu, HI 96822, USA — [3]Gesellschaft für Schwerionenforschung, Planckstrasse 1, D-64291 Darmstadt — [4]Institut für Theoretische Physik und Astrophysik, Universität Würzburg, D-97074 Würzburg

We study the constraints on a minimal supersymmetric seesaw model imposed by neutrino data, charged lepton flavor violation, thermal leptogenesis and perturbativity. We show that it is possible to constrain the three heavy Majorana neutrino masses as well as the complex Yukawa coupling matrix. Our results provide a first step towards a seesaw benchmark model for further phenomenological studies and model building.

T 502.5 Do 17:40 P1-02-323

Squarks and Sleptons between Branes and Bulk — •Kai Schmidt-Hoberg, Wilfried Buchmueller, and Joern Kersten — DESY Theory Group, 22603 Hamburg, Germany

We study gaugino-mediated supersymmetry breaking in a six-dimensional SO(10) orbifold GUT model where quarks and leptons are mixtures of brane and bulk fields. The couplings of bulk matter fields to the supersymmetry breaking brane field have to be suppressed in order to avoid large FCNCs. We derive bounds on the soft supersymmetry breaking parameters and calculate the superparticle mass spectrum.
[1] hep-ph/0512152

T 502.6 Do 18:00 P1-02-323

Seiberg-Witten Maps to All Orders for Scattering Processes in NCQED — •Jörg Zeiner, Thorsten Ohl, and Reinhold Rückl — Institut für Theoretische Physik und Astrophysik, Universität Würzburg

We construct the Seiberg-Witten maps for noncommutative QED to all orders of the noncommutative parameter $\theta_{\mu\nu}$, but to finite order in the gauge field A_μ. Furthermore, we calculate the scattering amplitude for $e^+e^- \to \gamma\gamma$ for energies above the noncommutative scale and study the tree-level unitarity of the theory.

T 502.7 Do 18:20 P1-02-323

Noncommutative Geometry Beyond the Standard Model — •Christoph Alexander Stephan — CPT, CNRS-Luminy Case 907, 13288 Marseille, France

During the last two decades Alain Connes developed Noncommutative Geometry, which allows to unify two of the basic theories of modern physics: General Relativity and the Standard Model of Particle Physics. In the noncommutative framework the Higgs boson, which had previously to be put in by hand, and many of the ad hoc features of the standard model appear in a natural way. The aim of this talk is to motivate this unification from basic physical principles and to give an flavour of its derivation. A classification of the relevant noncommutative geometries will be presented as well as possible extensions which arise from it. These extensions of the standard model contain novel fermions which provide viable candidates for the dark matter problem. A short overview on the cosmological implications of these fermions will be presented.