MP 4: Nichtkommutative Geometrie

Zeit: Dienstag 17:30–18:20 Raum: HS 8

MP 4.1 Di 17:30 HS 8

Noncommutative Geometry in the LHC-Era — •Christoph Stephan — Institut für Mathematik, Universität Potsdam, Germany

Noncommutative geometry (NCG) allows to unify the basic building blocks of particle physics, Yang-Mills-Higgs theory and General relativity, into a single geometrical framework. The resulting effective theory constrains the couplings of the Standard Model (SM) and reduces the number of degrees of freedom.

After briefly introducing the basic ideas of NCG, I will present its predictions for the SM and the few known models beyond the SM. Most of these models, including the Standard Model, are now ruled out by LHC data. But interesting extensions of the SM which agree with the presumed Higgs mass and predict new particles are still very much alive and await further experimental data.

MP 4.2 Di 17:55 HS 8

Deformations in Quantum mechanics — •Albert Much — MPI MIS, Leipzig, Deutschland

We consider deformations of quantum mechanical objects, and use the novel construction of warped convolutions for deformation. It turns out that through the deformation we are able to obtain several quantum mechanical effects where electromagnetic fields play a role. We understand the magnetic field as an object which is the outcome of strict mathematical deformation. Furthermore, we are able to obtain all magnetic fields by using this method of deformation. The results are used in quantum field theory to obtain an effective quantum plane.