



EINLADUNG

im Rahmen des Seminars für Mathematische Physik
(Joint TU/UV Theory Seminar)

zum Vortrag

von

Charlie Beil

(University of Graz)

über

“A combinatorial derivation of the standard model particles from the Dirac Lagrangian“

Abstract:

I will begin by introducing a modification to general relativity where time is stationary along the worldlines of fundamental particles. The aim of this new geometry is to describe certain quantum phenomena using (classical) spacetime metrics which are degenerate. For example, on such a spacetime the dimensions of tangent spaces vary, and spin wavefunction collapse is modeled by the projection from one tangent space to another. I will then describe how the free Dirac Lagrangian on such a spacetime yields the standard model particles.

Specifically, we obtain three generations of leptons and quarks, the electroweak gauge bosons, and the Higgs boson -- all with their correct spin, electric charge, and color charge -- together with precisely one new massive spin-2 boson. Finally, I will show how the trivalent interaction vertices arise from the combinatorics of the Dirac Lagrangian subject to two simple rules. In particular, we obtain electroweak parity violation for both leptons and quarks.

Zeit: Dienstag, 23.1.2024, 14:00

Ort: TU Wien, Freihaus, Wiedner Hauptstraße 8-10, 1040 Wien, Sem. R. DB gelb 03, 3.Stock

gez.: S. Fredenhagen, D. Grumiller, T. Tran, A. Fiorucci