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Quantum Field Theory on Noncommutative Curved Spacetimes

In this talk I show how to construct the quantum field theory of a free real scalar field on a class of noncommutative manifolds, obtained via deformation quantization using abelian Drinfel'd twists. I define action functionals in the framework of twist-deformed differential geometry, derive the associated equations of motion and solve them in terms of formal power series. In analogy to the commutative case, the space of solutions of the deformed wave equation can be equipped with a symplectic structure and thus can be quantized in terms of suitable *-algebras of field observables. As an application, I present the convergent deformation of a simple FRW model and point out the similarities and differences to formal deformation quantization.

Primary author: Mr SCHENKEL, Alexander (Wuerzburg University)

Presenter: Mr SCHENKEL, Alexander (Wuerzburg University)