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The Nonlinear Field Space Theory

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In recent years the idea that not only the configuration space of particles, i.e. spacetime, but also the corresponding momentum space can have a nontrivial geometry has attracted significant attention, especially in the context of quantum gravity. The aim of the talk is to discuss extension of this concept to the domain of field theories, the so-called Nonlinear Field Space Theory (NFST). After presenting the motivation and general aspects of the approach we will focus on analysis
of the prototype (quantum) NFST of a scalar field. The case of a compact field space is especially interesting, which is a natural way to implement the "Principle of finiteness"of physical theories, which once motivated the Born-Infeld theory. Predictions and possible areas of application of NFST will be discussed, with a focus on two aspects of NFST: possible role of NFST in early universe cosmology and "predicted renormalization" of the charge and speed of propagation of field excitations.

Summary

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