

Theorie-Palaver

Jan. 30, 2024 at 2 p.m.
Lorentz room (Staudingerweg 7, 5th floor)

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Non-minimal effects in the axion/ALP EFT

Singlet scalars, namely axion-like particles (ALPs), are among the most promising candidates of new physics. Standard (minimal) assumptions in the study of these particles might however hide a large landscape of solutions to different puzzles in the Standard Model, which can limit our discovery potential. In the first part of the talk, I will consider the impact of scalar mixing in the standard axion mechanism to solve the strong CP problem. I will show that the canonical axion mass-scale relation can be modified within QCD and multiple signals may be required to reconstruct the full solution to the strong CP problem, constrained by a precise sum rule. In the second part of the talk, I will discuss the impact of operator mixing, via RGEs, in the ALP parameter space. I will specially focus on shift-breaking and CP violating effects, and I will discuss some phenomenological applications.