

FLASY 2018: 7th Workshop on Flavour Symmetries and Consequences in Accelerators and Cosmology



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Several Problems in Particle Physics and Cosmology Solved in One SMASH

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The Standard Model (SM) of particle physics is a big success. However, it lacks an explanation of cosmic inflation, of the matter-anti-matter asymmetry of the Universe, of dark matter, of neutrino oscillations, and of the feebleness of strong CP violation. The latter may be explained by an extension of the Standard Model by a complex scalar field charged under a spontaneously broken global U(1) Peccei-Quinn (PQ) symmetry. Moreover, the pseudo Nambu-Goldstone boson of this breaking - the axion - may play the role of dark matter. Furthermore, the PQ scalar can feature as a viable inflaton candidate if its possible non-minimal coupling to the Ricci scalar is taken into account. Finally, adding three extra SM-singlet neutrinos, the model dubbed SMASH – for SM-Axion-Seesaw-Higgs portal inflation – solves all the five problems mentioned above at one stroke. It can be probed decisively by upcoming cosmic microwave background and dark matter experiments.

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