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Axion-like particles and CP violation

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CP-violating probes are among the most promising and yet relatively unexplored ways to look for Axion-Like Particles (ALPs) and to investigate their phenomenology. In this talk, I will offer a complete and up-to-date overview of these new physics candidates. First, I will discuss in detail the phenomenology associated to this class of ALPs, with a focus on the possibility to probe them by studying their indirect impact on the electric dipole moments (EDMs) of particles, nucleons, nuclei and molecules. In the second part of the talk, I will rather muse on the possible origin of these particles. In doing so, I will provide an overview of the possible UV completions leading to the appearance of a CP-violating ALP and I will discuss the different predictions that can be drawn from each specific scenario.

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