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„Light shining through the wall? Experimental searches for the axion and its relatives“

Particle physics beyond the Standard Model could be manifest in new high-energy (i.e. very massive) degrees of freedom but it is also conceivable to be hidden at very low energy scales, if very weakly coupled. An example for such new physics is the Axion, which is predicted within a possible solution to the strong CP problem, and at the same time is a fine cold Dark Matter candidate. Searching for the axion is possible directly in laboratory setups, as well as through astrophysical and cosmological observations.

More generally, very light particles with very weak couplings such as axion-like particles and hidden photons have been identified in beyond-the-Standard-Model-scenarios and as cold Dark Matter candidates. In this talk I will briefly review the theory and motivation of this class of light and weakly coupled particles and give an overview of the current and planned experimental searches for them with an emphasis on the ALPS-II experiment at DESY, which will see 'light shining through a wall' if axion-like particles exist.