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Axion as a non-WIMP dark matter candidate

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The axion arises as a pseudo Nambu-Goldstone boson from the spontaneous breaking of a hypothetical global Peccei-Quinn symmetry introduced to provide a solution to the strong CP problem of quantum chromodynamics. Due to the weakness of the coupling with ordinary matters, the axion is regarded as a viable candidate of dark matter of the universe. However, the estimation of the axion dark matter abundance is not so straightforward if we follow the evolution of the axion field in the context of inflationary cosmology. As a result, the prediction for the mass of axion dark matter depends strongly on the early history of the universe according to the detailed construction of underlying particle physics models. In this contribution, after a quick overview of non-WIMP dark matter candidates, we review recent developments of the theoretical estimation of the axion dark matter abundance and discuss their implications for present and future experimental tests.

Experimental Collaboration

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