

Searching for axions with metamaterials: the ALPHA detector

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Among the theoretical particles that could explain dark matter, axions make an ideal candidate. They can be produced in the early Universe and make up the observed abundances, permeating the universe as an invisible wave. In recent years, the efforts to build a kind of radio that would tune to this unique frequency has intensified, with conventional techniques failing to look for high frequencies. By arranging materials macroscopically in a clever fashion (so called metamaterials) to engineer a custom plasma, the Axion Longitudinal Plasma Haloscope (ALPHA) will allow for some of the best motivated and most difficult frequencies to be scanned, potentially revealing the nature of dark matter. The talk reviews the most recent progress of the consortium as well as providing an overview of potential search strategies.

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