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The Canfranc Axion Detection Experiment (CADEx): a novel haloscope search for Dark Matter axions in the mass range 330–460 μeV

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A range of haloscope searches are currently probing axions in the mass range ~2-40 μeV. However, simulations of the axion field in the early Universe are increasingly pointing towards heavier masses if we want the axion to comprise all of the Dark Matter in the Universe. I will briefly review these developments and then I will present The Canfranc Axion Detection Experiment (CADEx), a proposed haloscope search in the well-motivated but currently under-explored mass range 330-460 μeV. CADEx, to be installed at the Canfranc Underground Laboratory, will consist of an array of microwave resonant cavities in a static magnetic field, coupled to a highly sensitive detecting system based on Kinetic Inductance Detectors. I will present the timeline for CADEx as well as forecasts for its sensitivity to axions, dark photons, and more. Finally, I will discuss the complementarity of CADEx with other proposed lab-based and astrophysical searches for axion-photon conversion.

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