Abstract Submitted
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Searching for Higher Mass Axion Dark Matter at the University of Western Australia[1] BEN MCALLISTER, MICHAEL TOBAR, MAXIM GORYACHEV, EUGENE IVANOV, GRAEME FLOWER, CATRIONA THOMSON, AARON QUISKAMP, WILLIAM CAMPBELL, University of Western Australia — Axions are a popular dark matter candidate, due to their ability to both constitute cold dark matter, and solve the Strong CP problem. The most common axion search technique is the haloscope, which attempts to convert galactic halo axions into photons. Confounding haloscopes is the fact that the axion mass (and the energy of the photons produced) is unknown. This necessitates experiments over a broad mass range. Recent work has indicated the high (>50 mu-eV) axion mass range as especially promising, but haloscope techniques become impractical in this range due to technical factors.
At UWA we are constructing a suite of axion detection experiments to access the high mass regime. This includes ORGAN [1], UPLOAD/DOWNLOAD [2], and Axion-Magnon experiments [3]. I will give an overview of these efforts, and novel resonator designs for high mass haloscopes. 1. The ORGAN Experiment: An axion haloscope above 15 GHz, B. T. McAllister et al, Phys.Dark Univ. 18 (2017) 67-72 2. Results from UPLOAD-DOWNLOAD: A phase-interferometric axion dark matter search, C. A. Thomson et al, 2019 e-Print: arXiv:1912.07751 3. Broadening frequency range of a ferromagnetic axion haloscope with strongly coupled cavity–magnon polaritons, G. Flower et al, Phys.Dark Univ. 25 (2019) 100306

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