

# Novel Ways to Hunt Axion Dark Matter: Observation and Experiment

*Wednesday 27 February 2019 09:30 (1 hour)*

Identification of dark matter has been an outstanding problem for decades, and axion (or axion like particles) is one of the most popular dark matter candidates. A number of observations and experiments have tried to detect axion by using the axion-photon conversion by assuming the axion is coupled to photon, while no signal yet to be found. In this talk, I will discuss new techniques to search for axion dark matter (ADM) by focusing on another phenomena, birefringence, which is caused by the same coupling. The polarimetry observation of protoplanetary disks puts the best constraint on ADM for fuzzy dark matter mass ( $m = 10^{-22}$ eV). I also propose a laser-cavity experiment which can improve the sensitivity by several orders of magnitude in the intermediate mass range ( $10^{-17}$ eV  $< m < 10^{-12}$ eV).

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