

# BREAD: Broadband Reflector Experiment for Axion Detection

*Monday, 8 July 2024 15:08 (18 minutes)*

We report on the status of BREAD - a novel dish antenna for broadband  $\sim \mu\text{eV}$ -eV wave-dark matter detection, which allows to utilize state-of-the-art high-field solenoidal magnets. Axions are converted non-resonantly to photons on a cylindrical metallic wall parallel to an external magnetic field. These photons are then focused using a novel reflector geometry onto a state-of-the-art high-sensitive photon detector. We recently demonstrated [PRL 128 (2022) 131801] that this concept using a  $\sim 10 \text{ m}^2$  conversion area in a  $\sim 10 \text{ T}$  solenoidal magnet has the potential to discover QCD axions spanning multiple decades in mass range. In this talk we present progress of our first stage pilot experiments - GigaBREAD [PRL 132 (2024) 131004] and InfraBREAD - covering different mass ranges. We outline the status of current R&D and recent results. We discuss upscaling to larger, cryogenic and magnetized versions as well as a new 9T large-bore magnet facility at Fermilab to realize such experiments - the Dark Wave Laboratory.

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