

COLLOQUIUM

Visions of axion multi-messenger physics with helioscopes

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Abstract An ever-growing number of experiments is exploring the remaining QCD axion and axion-like particle (ALP) parameter space, which includes the exciting prospect of discovering theoretically preferred QCD axion models. I will thus entertain the possibility of an axion discovery and muse on its use in observations. In particular I focus on helioscope searches, which employ strong

magnetic fields to hopefully detect axions coming from the Sun. The next generation of these instruments could not only discover an axion but potentially measure its mass and help us to identify its UV structure. Once discovered, axions may be used to study solar properties such as solar metallicity, macroscopic solar magnetic fields or, as we showed recently, to determine the temperature profile through the Sun's interior. I will explicitly demonstrate the latter using benchmark models and simulated data for the upcoming helioscope IAXO and briefly comment on complementary (astrophysical) probes and ideas.

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3.00 pm (CEST)

Join at: <https://meet.google.com/pdy-bpuf-jsg>