

# Topological axion electrodynamics and 4-group symmetry

*Tuesday, 7 December 2021 15:00 (20 minutes)*

We study higher-form symmetries and a higher group in the low energy limit of a  $(3 + 1)$ -dimensional axion electrodynamics with a massive axion and a massive photon. A topological field theory describing topological excitations with the axion-photon coupling, which we call a topological axion electrodynamics, is obtained in the low energy limit. Higher-form symmetries of the topological axion electrodynamics are specified by equations of motion and Bianchi identities. We find that there are induced anyons on the intersections of symmetry generators. By a link of worldlines of the anyons, we show that the worldvolume of an axionic domain wall is topologically ordered. We further specify the underlying mathematical structure elegantly describing all salient features of the theory to be a 4-group.

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**Session Classification:** Short talk