

Maxwell theory of fractons

Wednesday, 27 September 2023 09:45 (20 minutes)

In this talk I will show that the main properties of the fracton quasiparticles can be derived from a generalized covariant Maxwell-like action. Starting from a rank-2 symmetric tensor field, a partially symmetric rank-3 tensor field strength can be built, which obeys a kind of Bianchi identity. The most general action invariant under the covariant “fracton” transformation consists of two independent terms: one describing Linearized Gravity (LG) and the other referable to fractons, a proof of the always suspected relation between fractons and gravitons. I will also discuss that, as claimed in the Literature, the fracton part can be reconduced to a generalized Maxwell theory. In particular, in the covariant generalization of the fracton theory, the equations describing the fracton limited mobility, i.e. the charge and dipole conservation, are not external constraints, but rather consequences of the field equations of motion, hence of the invariant action and, ultimately, of the fracton covariant symmetry.

Primary author: BERTOLINI, Erica

Presenter: BERTOLINI, Erica

Session Classification: Topical Talks