

Massachusetts Institute of Technology
Department of Physics

Condensed Matter Theory Seminar

“Emergent Gravity in Fracton Systems”

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Abstract: Symmetric tensor gauge theories feature an exotic type of excitation known as "fractons," which cannot move in isolation. Surprisingly, these immobile particles are found even in rank 2 symmetric tensor theories, featuring an emergent graviton. This is somewhat puzzling, since we expect gravitational charges to be mobile objects. In this talk, I will present the solution to this puzzle, reconciling the fractonic and gravitational structure of rank 2 gauge theories. While an isolated fracton is immobile, fractons are endowed with a finite inertia by the presence of a finite density of other fractons, providing a concrete realization of Mach's principle. In such a finite density background, fractons attract each other through a geometric "force," resulting in motion along extremal curves of an emergent geometry. In this way, the expected properties of gravity can be recovered in rank 2 fracton systems.

12:00pm
Friday, March 24, 2017
Duboc Room (4-331)

Host: Sagar Vijay