

Massachusetts Institute of Technology
Department of Physics

Condensed Matter Theory Seminar

“Fracton topological order via coupled layer construction”

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Abstract: Fracton topological order is a new type of topological order discovered in various exactly solvable models with immobile, point-like topological excitations, and sub-extensive topological degeneracy. In this talk, I will present a coupled layer construction for fracton models in $d = 3$ spatial dimensions. By coupling 2d toric code layers and double semion models, we are able to realize the recently proposed X-cube model and the semionic version of it. By coupling X-cube models, we propose a new model exhibiting fracton topological order, dubbed the four color cube (FCC) model. The coupling mechanisms can be understood as condensation of strings or membranes built from point particles. This construction allows some fracton topological phases to be understood in terms of the degrees of freedom of familiar lower-dimensional topological states. Besides, I will also briefly illustrate the gauge structure for the X-cube model.

12:00pm
Thursday, March 30, 2017
Duboc Room (4-331)

Host: Michael Pretko