

Massachusetts Institute of Technology
Department of Physics

Condensed Matter Theory Seminar

"Some applications of the classification of topological crystalline phases"

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Abstract: Recently, a systematic understanding of strongly interacting topological phases of matter with spatial symmetry (topological crystalline phases) has been developed. In this talk, I will briefly review the general framework and introduce a geometrical picture for such phases. Then, I will discuss two concrete applications:

(a) A general, "topological" approach to the Lieb-Schultz-Mattis theorems and its generalizations, which constrain the nature of possible spin liquid ground states in quantum magnets. I will show how ideas from the classification of topological crystalline phases allows one to put such results on a general footing.

(b) I will show how the notion of "fragile band topology", which corresponds to topological band structures that are non-trivial yet can be trivialized by adding trivial occupied bands, has a natural analog in strongly interacting systems. This gives rise to a notion of "non-trivial topology" in interacting systems that has previously been missed.

12:00pm
Wednesday, April 17, 2019
Duboc Room (4-331)