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Fracton topological phases and Foliated field theories

I will talk about fracton topological phases (and fracton-like phases) which have quasi-particle excitation like anyons with mobility constraints. It has recently attracted interests in the context of condensed matter physics, quantum information and high energy physics. From condensed matter viewpoint, it describes exotic properties of matter which may be realized in future. From quantum information viewpoint, related lattice models may be useful to make new quantum error correcting codes and quantum hard disks because the models typically have large degeneracy of ground states and can be regarded as generalization of the toric code. From high energy physics viewpoint, fracton topological phases seem to be related to a new type of symmetries called modulated symmetries and a new class of field theories which are partially topological. I will start with explaining relevant concepts and motivations of the topic using some simple examples. Then I will talk about relations to modulated symmetries and foliated field theories.

Author: HONDA, Masazumi (RIKEN iTHEMS / Saitama University)

Presenter: HONDA, Masazumi (RIKEN iTHEMS / Saitama University)