

Chez Pierre

Presents ...

Monday, November 17, 2008

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MIT Room 4-331



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“Observation of a new class of topological states of quantum matter”

Most quantum states of condensed-matter are categorized by the symmetries they break. The remarkable discovery of charge quantum Hall effects (1980s) revealed that there exists an organizational principle of matter based only on the topological distinctions but in the presence of time-reversal symmetry breaking. In the past few years, theoretical developments suggest that new classes of topological states of matter might exist that are purely topological in nature in the sense that they do not break time-reversal symmetry hence can be realized without any applied magnetic field. In this presentation, I report a series of experimental results demonstrating the existence of a topologically ordered time-reversal-invariant quantum state of matter and discuss the unusual electromagnetic, transport and spin properties this novel phase of quantum matter might exhibit.