

Massachusetts Institute of Technology
Department of Physics

Condensed Matter Theory Seminar

“Anderson localization in the presence of topologically protected channels”

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Abstract: We study transport and localization in quasi-one-dimensional systems where topologically protected and unprotected channels coexist. These can be realized in a Weyl semimetal in magnetic field, at the interface between two quantum Hall systems or at the edge of a stack of 2D topological insulators. The problem is technically described by a (supersymmetric) non-linear sigma model with a topological term. The model is solved exactly in all symmetry classes by mapping to a corresponding time evolution problem via the transfer matrix method. The solution provides exact analytic expressions for DC transport quantities such as conductance and shot noise as well as dynamic local response functions such as return probability and correlations of local density of states. Our main qualitative conclusion is that localization of the unprotected channels is drastically enhanced in the presence of protected ones.

2:00pm
Monday, April 3, 2017
Duboc Room (4-331)

Host: Senthil Todadri