The Abdus Salam International Centre for Theoretical Physics

United Nations Educational, Scientific and Cultural Organization

IAEA International Atomic Energy Agency

Conference on Frontiers of Nanoscience
24 August - 1 September 2015, Trieste, Italy

Quantum Criticality of 1D Topological Anderson Insulators

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Abstract:

I will talk about recent analytical understanding of quantum criticality in quasi one-dimensional topological Anderson insulators. We describe these systems in terms of two-parameter effective theory representing localization and topological properties, respectively. Certain critical values of the second parameter define phase boundaries between distinct topological sectors. Upon increasing system size, the two parameters exhibit flow similar to the celebrated two parameter flow of the integer quantum Hall insulator. However, unlike the quantum Hall system, an exact analytical description of the entire phase diagram can be given in terms of the transfer-matrix solution of corresponding supersymmetric non-linear sigma-models. In Z2 classes we uncover a hidden supersymmetry, present at the quantum critical point.