

Kolloquium Mathematische Physik

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Introduction to the non commutative topology of topological insulators

Topological insulators are insulating materials which are in a topological non-trivial phase. Perhaps the most exciting consequence of this is the existence of boundary resonances (for instance boundary currents) which are robust against disorder. Mathematically this is related to a bulk boundary correspondence linking topological invariants of the bulk of the material to topological invariants associated to the boundary. Our approach uses K-theory and cyclic cohomology of operator algebras.

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