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Emil Prodan*, 245 Lexington Av., New York, NY 10016. *On the non-commutative geometry of topological insulators and superconductors.*

I will review the extraordinary conjectures related to topological insulators and superconductors and how more than half of them were solved within the framework of non-commutative geometry. In particular, I will discuss 1) the C^* -algebras of bulk and boundary physical observables and how the bulk-boundary principle is formulated with K and KK theories and 2) how natural pairings and Kasparov products lead to local index theorems that can be pushed over Sobolev spaces. The latter cover the regimes of so-called strong disorders, where the conjectures are formulated. As such, these index theorems enable one to draw extremely fine conclusions about the quantum dynamics of the electrons in realistic laboratory conditions. (Received September 08, 2019)