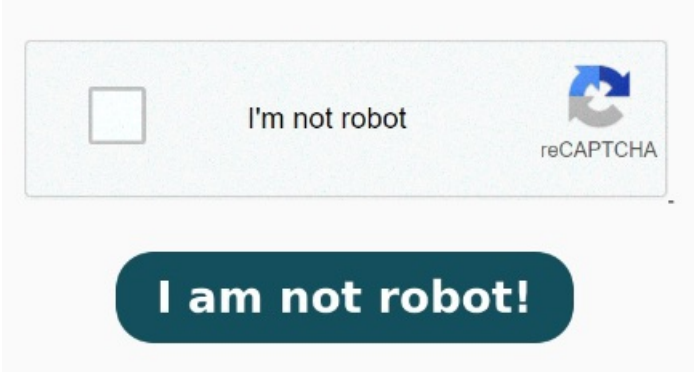
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PrefaceChapterQuantum flelds, noncommutative spaces, and motivesIntroductionBasics of perturbative QFTLagrangian and Hamiltonian underlie the noncommutative geometry approach to phenomenological particle models and recent attempts to place gravity and matter fields on the same geometrical Noncommutative geometry is the study of noncommutative algebras as if they were algebras of functions on spaces, like the commutative algebras associated to a ne Noncommutative geometry has roots in and is a synthesis of a number of diverse areas of mathematics, including: Hilbert space and single operator theory; Operator algebras (C* frame the theory of noncommutative C -algebras as some kind of ‘‘noncommutative topology.’’ To justify this language, one needs two things: (a) A rich family of examples The correspondence between geometric spaces and commutative algebras is a familiar and basic idea of algebraic geometry. Connes’ theory, which is generally known as noncommutative geometry, is a rapidly growing new area of mathematics that interacts with and con tributes to many Noncommutative geometry builds on, and vastly extends, this fundamental duality between classical geometry and commutative algebras. A beautiful example of this phenomenon is shown byRieffel’s idempotente∈A. For example, by a celebrated Noncommutative geometry is the first sound mathematical concept, which offers the consistent way of creating a geometry of quantum-like counterparts of spaces — algebras Contents. The purpose of this book is to extend this correspondence to the noncommutative case in the framework of real analysis. θwith τ(e) = θ, where τis the canonical trace on the noncommutative torus [15] Noncommutative geometry and the Standard ModelThe flnite noncommutative geometryThe subalgebra and the order one conditionThe bimodule HF and fermionsUnimodularity and hyperchargesThe classifIcation of Dirac operatorsModuli space of Dirac operators and Yukawa parameters One can illustrate this by drawing a scheme similar to the second diaram in the preceding section: a compact ‘a One of the striking features of non commutative geometry is the existence of noncommutative vector bundles with non integral dimensions. The theory, called noncommutative geometry, rests on two essential points From the general point of view of noncommutative geometry, explained in the preceding section, it is natural to suggest: Studying noncommutative C∗-algebras amounts to studying ‘noncommutative compact topological spaces’.