1086-58-1898 **Branimir Cacic*** (branimir@caltech.edu), Department of Mathematics, California Institute of Technology, 1200 E California Blvd, MC 253-37, Pasadena, CA 91125. *Dirac-type operators in noncommutative geometry.*

The Gel'fand–Naĭmark duality establishes a categorical equivalence between compact Hausdorff spaces and commutative unital C^*-algebras, motivating the identification of C^*-algebras as noncommutative topological spaces. More recently, Connes proposed identifying noncommutative manifolds with spectral triples, and has indeed proved a partial analogue of Gel'fand–Naĭmark, the reconstruction theorem, which guarantees that so-called commutative spectral triples do indeed arise from compact oriented manifolds. We give a brief introduction to the theory of spectral triples from the perspective of the theory of Dirac-type operators, and in particular outline how Dirac-type operators arise in the theory of almost-commutative spectral triples, the spectral triples appearing in applications to theoretical high energy physics. We then show how to refine the reconstruction theorem into a precise noncommutative-geometric characterisation of compact oriented Riemannian manifolds together with Dirac-type operator, and hence obtain a reconstruction theorem for almost-commutative spectral triples. (Received September 24, 2012)