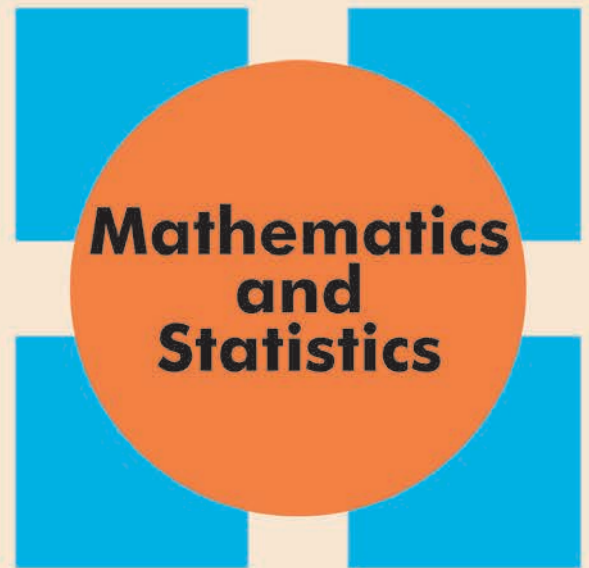


COLLOQUIUM

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Geometry of Noncommutative Spaces



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Abstract: The discovery of the relation between the category of Hausdorff compact topological spaces and the category of commutative unital C^* -algebras, Gelfand-Naimark theorem, in the mid twentieth century and the evolution of topological theories for noncommutative C^* -algebras, such as K -theory, established a theory that can be called noncommutative topology. The geometry for the noncommutative spaces, however, was not introduced until later, when Alain Connes showed that the geometry can be reformulated using spectral triples in which the geometric information is basically encoded in the spectrum of an operator D , called Dirac operator, which has compact resolvent and its commutator with the elements of the algebra is bounded. The main focus of this talk will be on how the spectrum of the Dirac operator D can be used to recover some geometric notions and quantities such as volume and dimension. In particular, we shall discuss the recent developments in introducing the scalar curvature and Ricci functional.