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Noncommutative Gelfand duality: a pathway to noncommutative spacetimes

Abstract: The duality between algebraic structures and geometric spaces is of paramount importance in mathematics and physics, because provides a dictionary to describe manifolds and variaties in a purely algebraic fashion. In his seminal paper, Gelfand showed that a topological space can be functorially reconstructed from its Banach algebra of continuous functions. Conversely, the Gelfand spectrum of the algebra of continuous functions is homeomorphic to the underlying topological space.
The goal of this talk is to constrcut a sufficiently robust notion of non-commutative spectrum for general (possibly non-commutative) rings that allows one to implement a non-commutative analog of Gelfand duality. This will be achieved using state-of-the-art techniques from derived algebraic geometry. It time permits, we will compare our notion of spectrum with the Grothendieck spectrum, showing that there always exists a map of ringed spaces between these spectra.