

# QUANTUM LATTICE GAUGE THEORIES AND THEIR CONTINUUM LIMIT, A NONCOMMUTATIVE APPROACH

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ABSTRACT. We will describe the quantisation of gauge theories on a lattice/graph in terms of their algebras of observables and of the Hilbert space on which the algebra is represented. The algebra of observables for the quantum system admits a natural geometric realization as a groupoid  $C^*$ -algebra. We will study the behaviour of such algebras under lattice refinements and the resulting continuum limit of the theory.

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