quantum field theories (QFT)*

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2013-03-22 1:16:33

This topic links the general framework of quantum field theories to group symmetries and other relevant mathematical concepts utilized to represent quantum fields and their fundamental properties.

0.1 Fundamental, mathematical concepts in quantum field theory

Quantum field theory (QFT) is the general framework for describing the physics of relativistic quantum systems, such as, notably, accelerated elementary particles.

Quantum electrodynamics (QED), and QCD or quantum chromodynamics are only two distinct theories among several quantum field theories, as their fundamental representations correspond, respectively, to very different– $U(1)$ and $SU(3)$– group symmetries. This obviates the need for 'more fundamental' , or extended quantum symmetries, such as those afforded by either larger groups such as $U(1) \times SU(2) \times SU(3)$ or spontaneously broken, special symmetries of a less restrictive kind present in 'quantum groupoids' as for example in weak Hopf algebra representations, or in locally compact groupoid, G_{lc} unitary representations, and so on, to the higher dimensional (quantum) symmetries of quantum double groupoids, quantum double algebroids, quantum categories,quantum supercategories and/or quantum (supersymmetry) superalgebras (or graded 'Lie' algebras); see, for example, their full development in a recent QFT textbook [**?**] that lead to superalgebroids in quantum gravity or QCD.

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*⟨*QuantumFieldTheoriesQFT*⟩ created: ⟨*2013-03-2*⟩ by: ⟨*bci1*⟩ version: ⟨*40753*⟩ Privacy setting: ⟨*1*⟩ ⟨*Topic*⟩ ⟨*55U99*⟩ ⟨*81T80*⟩ ⟨*81T75*⟩ ⟨*81T70*⟩ ⟨*81T60*⟩ ⟨*81T40*⟩ ⟨*81T25*⟩ ⟨*81T18*⟩ ⟨*81T13*⟩ ⟨*81T10*⟩ ⟨*81T05*⟩

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