

# Octonion Quantum Chromodynamics

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Starting with the usual definitions of octonions, an attempt has been made to establish the relations between octonion basis elements and Gell-Mann  $\lambda$  matrices of  $SU(3)$  symmetry on comparing the multiplication tables for Gell-Mann  $\lambda$  matrices of  $SU(3)$  symmetry and octonion basis elements. Consequently, the quantum chromo dynamics (QCD) has been reformulated and it is shown that the theory of strong interactions could be explained better in terms of non-associative octonion algebra. Further, the octonion automorphism group  $SU(3)$  has been suitably handled with split basis of octonion algebra showing that the  $SU(3)_C$  gauge theory of colored quarks carries two real gauge fields which are responsible for the existence of two gauge potentials respectively associated with electric charge and magnetic monopole and supports well the idea that the colored quarks are dyons.

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