Abstract Submitted
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The Yang-Mills Mass Gap Solution JAY R. YABLON, MIT Alumnus — The Yang-Mills Mass Gap problem is solved by deriving $SU(3)_C$ Chromodynamics as a corollary theory from Yang-Mills gauge theory. The mass gap is filled from finite non-zero eigenvalues of a configuration space inverse perturbation tensor containing vacuum excitations. This results from carefully developing six equivalent views of Yang-Mills gauge theory as having: 1) non-commuting (non-Abelian) gauge fields; 2) gauge fields with non-linear self-interactions; 3) a "steroidal" minimal coupling; 4) perturbations; 5) curvature in the gauge space of connections; and 6) gauge fields related to source currents through an infinite recursive nesting. Based on combining classical Yang-Mills electric and magnetic source field equations into a single equation, confinement results from showing how magnetic monopoles of Yang-Mills gauge theory exhibit color confinement and meson flow and have all the color symmetries of baryons, from which we conclude that they are one and the same as baryons. Chiral symmetry breaking results from the recursive behavior of these monopoles coupled with viewing Dirac's gamma matrices as Hamiltonian quaternions extended into spacetime. Finally, with aid from the "steroidal" view, the recursive view of Yang-Mills enables polynomial gauge field terms in the Yang-Mills action to be stripped out and replaced by polynomial source current terms prior to path integration. This enables an exact analytical calculation of a non-linear path integral using a closed recursive kernel and yields a non-linear quantum amplitude also with a closed recursive kernel, thus proving the existence of a non-trivial relativistic quantum Yang–Mills field theory on R^4 for any simple gauge group G.

Jay R. Yablon
MIT Alumnus

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