

Meeting: 1000, Albuquerque, New Mexico, SS 5A, Special Session on Categories and Operads in Topology, Geometry, Physics and Other Applications

1000-78-193 **Louis H. Kauffman*** (kauffman@uic.edu), Math UIC, 851 South Morgan Street, Chicago, IL 60607-7045. *Non-Commutative Worlds and the Feynman-Dyson Derivation of Electromagnetism*. Preliminary report.

This talk discusses the mathematical and physical consequences of taking a non-commutative background for calculus and dynamics. We show how discrete calculus fits into non-commutative worlds, and how differential geometry, Hamiltonian mechanics, gauge theory and electromagnetism are generated there. In particular we give a new derivation of a generalization of the Feynman-Dyson derivation of electromagnetism, and we give discrete models of this generalization. These models will be compared with Feynman checkerboard model of the Dirac equation. (Received August 24, 2004)