Complexity in Quantum Field Theory and physics beyond the Standard Model ERVIN GOLDFAIN, OptiSolve Consulting — Complex Quantum Field Theory (abbreviated c-QFT) is introduced in this paper as an alternative framework for the description of physics beyond the energy range of the Standard Model. The mathematics of c-QFT is based on fractal differential operators that generalize the momentum operators of conventional quantum field theory (QFT). The underlying premise of our approach is that c-QFT contains the right analytical tools for dealing with the asymptotic regime of QFT. Canonical quantization of c-QFT leads to the following conclusions i) the Fock space of c-QFT includes *fractional numbers* of particles and antiparticles per state, ii) c-QFT represents a generalization of Chern-Simons field theory and iii) classical limit of c-QFT is equivalent to field theory in *curved space-time*. According to this picture, c-QFT may be regarded as a natural bridge between General Relativity and QFT.

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Date submitted: 05 Jul 2005

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