Abstract Submitted
for the APR16 Meeting of
The American Physical Society

Compactification on phase space BENJAMIN LOVELADY, JAMES WHEELER, Utah State Univ — A major challenge for string theory is to understand the dimensional reduction required for comparison with the standard model. We propose reducing the dimension of the compactification by interpreting some of the extra dimensions as the energy-momentum portion of a phase-space. Such models naturally arise as generalized quotients of the conformal group called biconformal spaces. By combining the standard Kaluza-Klein approach with such a conformal gauge theory, we may start from the conformal group of an n-dimensional Euclidean space to form a 2n-dimensional quotient manifold with symplectic structure. A pair of involutions leads naturally to two n-dimensional Lorentzian manifolds. For n = 5, this leaves only two extra dimensions, with a countable family of possible compactifications and an SO(5) Yang-Mills field on the fibers. Starting with n=6 leads to 4-dimensional compactification of the phase space. In the latter case, if the two dimensions each from spacetime and momentum space are compactified onto spheres, then there is an SU(2)xSU(2) (left-right symmetric electroweak) field between phase and configuration space and an SO(6) field on the fibers. Such a theory, with minor additional symmetry breaking, could contain all parts of the standard model.

Benjamin Lovelady
Utah State Univ

Date submitted: 08 Jan 2016 Electronic form version 1.4