Contribution ID: **12** Type: **Talk**

# The Hadronic Spectrum and Confined Phase in (1+1)-Dimensional Massive Yang-Mills Theory

*Friday, 27 June 2014 15:15 (20 minutes)*

Massive Yang-Mills theory is known to be renormalizable in 1+1 dimensions. The gluon mass is introduced by coupling the gauge field to an SU(N) principal chiral nonlinear sigma model. The proof of renormalizability relies on the asymptotic freedom of the sigma model. However, renormalization forces the gluon mass to infinity. The continuum theory is in a confined phase rather than a Higgs phase. The physical excitations of the system are hadron-like bound states of sigma model particles. We calculate the massive spectrum of meson-like bound states analytically, using the exact S-matrix of the sigma model. The baryon-like spectrum can be found in principle by solving a quantum mechanical N-body problem. We remark on the evidence for the confined phase found for SU(2) in recent lattice simulations by Gongyo and Zwanziger. Their simulations show evidence for a Higgs-like phase which seems to disappear with increasing volume, finding agreement with our analysis in the continuum.

**Primary author:** Dr CORTES CUBERO, Axel (City University of New York)

**Co-author:** Prof. ORLAND, Peter (City University of New York)

**Presenter:** Dr CORTES CUBERO, Axel (City University of New York)

**Session Classification:** Theoretical Developments

**Track Classification:** Theoretical Developments