

Department of Theoretical Physics

Free Meson Seminar

<i>Speaker</i>	:	Debasish Banerjee (Bern University)
<i>Topic</i>	:	Quantum simulation of real-time dynamics in Gauge Theories
<i>Day, Date & Time</i>	:	Thursday, August 16, 2012 at 2:30 p.m.
<i>Place</i>	:	AG 69

Abstract

A quantum simulator for a $U(1)$ gauge theory coupled to fermionic matter (Schwinger model) is constructed using quantum links, which realize continuous gauge symmetry with discrete quantum variables. At low energies, quantum link models with staggered fermions emerge from a Hubbard-type model which can be quantum simulated using a Fermi-Bose mixture of ultra-cold atoms in an optical lattice. This allows us to investigate string breaking as well as the real-time evolution after a quench in gauge theories, which are inaccessible to classical simulation methods. Although the model is simple example in $(1+1)$ -dimensions, there is, in principle, no problem in extending the method outlined here to higher dimensions and non-Abelian gauge theories.

(Nilmani Mathur)