

# SFB 608

## Einladung zum Kolloquium

- Ort:** Universität zu Köln  
II. Physikalisches Institut, Seminarraum 201
- Zeit:** 23. November 2005, 14:30 Uhr
- Sprecher:** Thierry Giamarchi  
DPMC  
University of Geneva  
24, quai Ernest-Ansermet  
CH1211 Geneva 4, Switzerland
- Thema:** Deconfinement in cold atoms in optical lattices

Despite the fact that by now one dimensional and three dimensional systems of interacting particles are reasonably well understood, very little is known on how to go from the one dimensional physics to the three dimensional one. This is in particular true in a quasi-one dimensional geometry where the hopping of particles between one dimensional chains can lead either to a dimensional crossover or worse to a deconfinement transition between a Mott insulating state and a metallic or superconducting/superfluid three dimensional state. Such a situation is relevant to many physical systems, such as the organic superconductors. Recently cold atoms in optical traps have provided a unique and controllable system in which to investigate this physics. I will thus discuss this physics for a system made of coupled one dimensional chains of interacting bosons or fermions and explore the observable consequences, such as the phase diagram, the energy absorption in time dependent optical lattices, and the possibility to realize unusual superconducting phases in such systems.

Gez. Prof. H. Kroha