



School of Nano Science



IPM Condensed Matter &
Statistical Physics Group

Weekly Seminar

Ultracold fermions in a cavity-induced artificial magnetic field

Invited Speaker:

Dr. Ameneh Sheikhan

University of Bonn

Abstract:

The tailored generation of topologically non-trivial quantum phases is of greatest interest as these phases possess special properties such as extended edge states that can be well protected against destructive environmental effects. The dynamic control and detection of such phases still remain a great challenge. In order to overcome these difficulties, we propose a mechanism by which the dynamical feedback between the atoms and the optical cavity mode leads to the emergence of an artificial magnetic field and to self-organizing topological phases. Fermions confined to an optical lattice with ladder geometry form either a chiral insulator or a chiral liquid carrying chiral currents. In two dimensions, fermions are found to self-organize into topologically non-trivial phases characterized by their corresponding edge states.

Wednesday, 10th Khordad 1396 (May 30, 2017), 14:00-15:00

Seminar Room (classroom A), Farmanieh Building, IPM