



School of Nano Science



IPM Condensed Matter &
Statistical Physics Group

Weekly Seminar

Spin Vortices in Single-electron Systems

Invited speaker: **Dr. Amin Naseri**

Postdoctoral researcher, Department of physics, University of Manitoba, Canada

Abstract:

Spin vortices are topological entities described by integer winding numbers and conventionally are sought in many-spin systems, e.g. ferromagnets. As advances in nanoscale physics made it possible to trap and manipulate single electrons in the laboratory, it has become relevant to ask whether it is possible to realize these topological features at a single-electron level. We present a study on the spin texture of an electron and show that an inhomogeneous magnetic field can turn the spin texture into a spin vortex. An analytical relation between the phases of the asymptotic eigenfunction and the components of the magnetic field is derived which reveals that the topological charge q of the vortex can take on any $q \in \mathbb{Z}$.

Wednesday, 2 Aban 1397 (Oct 24, 2018), 14:00-15:00

Seminar Room (classroom A), Farmanieh Building, IPM