



School of Nano Science



IPM Condensed Matter &  
Statistical Physics Group

## Weekly Seminar

### Light scattering from clusters of particles using multipole fields method

Invited speaker:

***Dr. Mahdiyeh Sadrara***

*School of Nano Science, IPM, Tehran, Iran*

#### **Abstract:**

Optical properties of aggregates distinct them from their bulk counterparts. Till now, light scattering from a populous cluster is mostly studied using the dipole approximation. In this study, we use multipole fields method to study the influence of arrangement of particles on the light absorption and scattering of a cluster. We pay attention to various nanoparticles, including charged, hollow, anisotropic, and metallic particles. We calculate electric and magnetic field enhancement in the gaps of dimers and trimers of hollow silicon and silver nanoparticles. We study the magneto-optical properties of gyrotropic particles. We calculate Faraday rotation of disordered and ordered clusters of Bi:YIG nanoparticles in view of a miniaturized Faraday rotator. Guided by the multiparticle Mie theory, we address Dirac electron scattering from a cluster of electrostatically defined circular quantum dots in graphene. As a result of deflection of charge carriers to one side of a finite sample, a transverse voltage may be generated. Our results suggest that not only ordered but also disordered clusters of quantum dots can be used to engineer the transport properties of the native graphene.

**Wednesday, 16 Mordad 1398 (August 7, 2019), 14:00-15:00**

**Seminar Room (Classroom A), Farmanieh Building, IPM**