



School of Nano Science



IPM Condensed Matter &  
Statistical Physics Group

## Weekly Seminar

### **Anisotropic Conductivity of Arsenene**

Invited speaker: *Ismaeil Abdolhosseini Sarsari*

*Department of Physics, Isfahan University of Technology*

#### **Abstract:**

One of the most recent groups of 2D materials is mono-elemental 2D materials which are highly regarded for their high charge carrier mobility, appropriate size and adjustable band gap and especially the remarkable anisotropy in many of their properties. The arsenene is a member of this group that some of its monolayer and nanoribbons properties have been studied in this project. Solving the Boltzmann transport equation for phonons, we predicted a highly anisotropic thermal conductivity of 30.4 and 7.8 W/mK along the zigzag and armchair directions, respectively, at room temperature. The electric conductivity of arsenene monolayer has also been studied by calculation of charge carrier mobility and quantum transport. Calculations of mobility were performed for perfect crystalline structures without impurities and only the effects of phonon scattering are considered using Takagi formula. The results show remarkable anisotropic conductivity in the armchair and zigzag directions.

**Wednesday, 8 Esfand 1397 (Feb 27, 2019), 14:00-15:00**

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