



School of Nano Science



IPM Condensed Matter &
Statistical Physics Group

Weekly Seminar

Nematic Liquid Crystal Colloids As Elastic Multipoles; and Their Atomic Properties

Invited speaker:

Dr. Seyed Reza Seyednejad

Department of Physics, IASBS. Zanjan, Iran

Abstract:

Colloids in nematic liquid crystals (NLCs) locally distort the uniform nematic order because of the boundary conditions on their surfaces so-called *surface anchoring*. This behavior naturally increases the free energy amount. Under some conditions, adjacent colloids can reduce the free energy by sharing a part of their accompanying distortions and make elastic bonds, just like atoms share their electrons in covalent bonds. The colloids in NLCs even make the specific number of bonds in specific directions depending on their shape and surface anchorings. This effect allows the colloids to form various crystalline and semi-crystalline colloidal structures in nematic environments. Such structures are known as *colloidal crystals* made by *colloidal atoms*, or photonic crystals due to their fabulous photonic properties.

During this session I will talk about the elastic properties of NLCs, the colloid surface anchorings in NLCs, interactions between the colloids and the possible crystalline structures they form.

Wednesday, 23 Bahamn 1398 (February 12, 2020), 14:00-15:00

Seminar Room (Classroom A), Farmanieh Building, IPM