

**Vahid Sandoghdar, Max Planck Institute for the Science of Light**

Talk Title: Microscopy and Tracking of Lipids, Proteins and Viruses via Interferometric Detection of Scattering (iSCAT)

Abstract: Lipids and proteins are some of the most ubiquitous and important components of a biological cell. In addition, biological nanoparticles such as viruses or exosomes play important roles in the physiology of living systems. Aside from their structure and chemical properties, the dynamics of these entities influences their function over time scales ranging from sub-nanoseconds to minutes and hours. Thus, it would be extremely insightful if one could monitor the motion of various subcellular nano-objects with nanometer spatial resolution over many temporal decades. The workhorse of biological imaging, fluorescence microscopy, confronts fundamental limits in satisfying this need. Here, we report on the application of interferometric scattering (iSCAT) microscopy on small gold nanoparticle labels and on unlabeled proteins or viruses with unprecedented combination of spatial and temporal resolution. We discuss several studies including diffusion of lipids in model membranes as well as three-dimensional diffusion and transport of membrane proteins and real-time secretion of proteins from a live cell.