Area Seminar

Title	Optical vortex and its quantum properties
Date and Time	11/08/2011 16:00:00
Speaker	Shashi Prabhakar PRL, Ahmedabad
Area	Theoretical Physics
Venue	Room No. 469
Abstract	Vortices are ubiquitous in nature like whirlpool in water, tornadoes and hurricanes. In optics vortices are singular points in the phase distribution of the field and dark points in the intensity distribution. The wavefront is helical in the vicinity of this singular point i.e. it has screw dislocation. The number of windings of the helical wavefront in a unit wavelength of light is known as the order of vortex. There are methods based on interference and diffraction to generate as well as to detect the optical vortices. In this talk, I will discuss and explore an easy method which can provide the order of the vortex and its theoretical and experimental feasibility. Due to helicity in the wavefront, these optical vortices carry orbital angular momentum (OAM). Spontaneous parametric down conversion (a non-linear method) can be used to entangle the OAM states using the conservation of angular momentum of photons. These states provide a platform for the study of higher-dimensional entanglement which is useful in quantum information. In this talk, I will also discuss experimental methods for entanglement of OAM states and its significance.