Area Seminar

Title	Optical vortices: Finding their charge and propagation through photorefractive materials.
Date and Time	03/08/2011 16:00:00
Speaker	Pravin Vaity PRL, Ahmedabad
Area	Theoretical Physics
Venue	Room No. 469
Abstract	We show that measurement of the topological charge and the orbital angular momentum (OAM) of optical vortex can be possible just by using a magnifying glass i.e. a spherical biconvex lens, an ubiquitous optical element found in any optics laboratory. A tilt of the the lens provides us the OAM state of the incident optical vortex. Moreover, this simple operation gives us the helicity of OAM state or the sign of topological charge as well. The experimental results have been verified with exact analytical expression. Then we present the investigation of scattering of optical vortices via beam fanning as they propagate in photorefractive materials. The measurements show that the rate of decay of the intensity depends on the order or topological charge of the vortex. This rate of decay for optical vortices is compared with that of the Gaussian beam which is found to be faster than the vortices. The experimental results are explained using dependence of the two wave mixing or beam coupling in the photorefractive materials on the degree of coherence. The coherence dependence of the beam fanning has been verified with partially coherent light also.