



**TIFR Centre for Interdisciplinary Sciences,
Narsingi, Hyderabad 500075**

Colloquium

Topological Structuring of Light

Nirmal Viswanathan

School of Physics, University of Hyderabad

Topology is a study of complex 2D and 3D curves, surfaces, structures etc. The fundamental generic topological structures in π and 2π symmetric fields are lemon, star, monstar and spiral, node, saddle, associated with index $I_u = \pm 1/2$ and $I_c = \pm 1$. The most exciting aspect about topological studies is the universality of the structures, independent of the physical systems reflecting the fact that the underlying physical phenomena are common to all branches of physics and science in general. Complex vector optical fields are best suited for such studies, over its scalar counter parts, as it provides accessible extra degrees of freedom. The complex optical fields are also of emerging research interest and have the potential for future applications such as in polarization imaging, angular momentum states of light encoded quantum information and hyper-entangled states of light. In this talk I will present the topological approach to structure and study experimentally realizable and controllable complex vector-vortex beam fields as we find this exercise very useful in visualizing and understanding some of the hitherto unknown aspects of optical fields. The fundamental connection between the topological structures and optical singularities will also be established during the talk.

Wednesday, Mar 5th 2014

4:00 PM (Tea/Coffee at 3:30 PM)

Seminar Hall, TCIS