OPEN TALK ANNOUNCEMENT

24 February 2015 **11:00 a.m.** **Fermion**

Speaker:

Prof. Phoolan Prasad

Department of Mathematics

Indian Institute of Science, Bangalore

Title:

Kinematical Conservation Laws (KCL)
(a model to study evolution of curves and surfaces)

Abstract:

I shall discuss in a very very simple way a particular case of a general theory in about 30 minutes. The abstract of the general theory is:

In a large number of physical phenomena, we _nd propagating surfaces which need mathematical treatment. d-D kinematical conservation laws (KCL) are equations of evolution of a moving surface t in d-dimensional (x1; x2; : : : ; xd)-space IRd. The KCL are derived in a specially de_ned ray coordinates (_1; _2; : : : ; _d□1; t), where _1; _2; : : : ; _d□1 are surface coordinates on t and t is time. KCL are the most general equations in conservation form, governing the evolution of t with physically realistic singularities.
A very special type of singularity is a kink, which is a point on t when t is a curve in IR2 and is a curve on t when it is a surface in IR3. Across a kink the normal n to t and normal velocity m on t are discontinuous. Since the KCL system contains only kinematical relations, it is an under-determined system of equations. In order to complete the system, we need to _nd additional equations representing the dynamics of t from the governing equations of the medium in which t propagates. The mathematical analysis of 3-D KCL system and computation with its help present a challenge since the eigenspace is not complete and there are geometric solenoidal constrains.
