



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

Seminar

**Fracture in materials undergoing phase
transformations**

Bharat Penmecha

**Mechanical Engineering
California Institute of Technology, MC 104-44
Pasadena CA 91125**

Abstract: A large number of technologically important materials undergo solid-solid phase transformations. Examples range from Ferroelectrics (transducers and memory devices), Zirconia (TBCs) to Nickel superalloys and (Lithium) Iron Phosphate (Li-ion batteries). These transformations involve a change in the crystal structure either through diffusion of species or local rearrangement of atoms. This change of crystal structure leads to a macroscopic change of shape or volume or both and results in an internal stress during the transformation. In certain situations this stress field gives rise to cracks (tin, iron phosphate etc.) which continue to propagate as the transformation front traverses the material. These observations serve as our motivation to study cracks in solids undergoing phase transformations. In this presentation I will discuss work on a few problems concerning the interplay between cracks and phase transformations.

Date: Monday, January 14th 2013

Time: 11:30AM (Tea/Coffee at 11:15AM)

Venue: Conference Hall, TCIS

All are cordially invited