



INDIAN INSTITUTE OF SCIENCE
BANGALORE -12

Cordially invites you to the

INSTITUTE COLLOQUIUM
(Mechanical Sciences)

by

Professor Vikram Jayram

Department of Materials Engineering

On

Fracture in Brittle Systems

Date : Tuesday, 30th October 2012

Venue : Faculty Hall, Main Building

Time : 4-00 p.m

Professor P. Balaram, Director
will preside

Tea: 5-00 p.m

Abstract

Despite the emergence of large engineering structures in the 19th century, post industrial revolution, catastrophic failures of boilers, bridges, rails and ships were routine events. In the 1920s, a formal understanding of fracture was developed through the pioneering work of, amongst others, an aerospace engineer, Griffith. Nevertheless, practising engineers did not routinely incorporate fracture mechanics into design until after World War II, following celebrated disasters, such as the Liberty ships and the Comet aircraft. Today, the concepts that evolved from asking where cracks come from and when they propagate, have been shown to be reliably applicable to structures that are many orders of magnitude smaller, such as coatings and MEMS. This talk will begin with some of the historical evolution of the study of fracture and end with the development of diagnostics to understand how failure may be studied in two modern coating systems: gradient thermal barriers that offer protection to blades in an aero-engine gas turbine, and hard coatings, sometimes nanostructured, that offer wear resistance to engineering components.