



FOR NOTICE BOARD

# INSTITUTE COLLOQUIUM

INDIAN INSTITUTE OF SCIENCE

**Prof. S.V. Bhat**

Department of Physics

will deliver a lecture

on

**EPR: A CAMERA FOR THE CHOREOGRAPHY OF ELECTRONS**

**on Tuesday, 11<sup>th</sup> February 2003  
at 4.00 p.m. in the Faculty Hall**

**THE DIRECTOR**

*will preside.*

*All are cordially invited*

**Coffee/Tea: 5.00 p.m.**

**Venue: Reception Hall**

## ABSTRACT

Electrons underpin most of the physical, chemical and biological phenomena of interest. Through bonding, interactions and by sheer dynamics electrons mediate and control the whole gamut of processes important in science and technology. In this lecture an attempt will be made to provide a ringside view of the role electrons play in some fascinating physico-chemical phenomena, as studied by the technique of electron paramagnetic resonance (EPR). Magnetism and electrical conductivity (especially superconductivity) are two most illustrious examples of the electron's two important attributes: the spin and the charge. We shall endeavour to show the power of EPR in understanding these phenomena by taking examples from our recent studies on charge ordering and colossal magneto-resistive rare earth manganites and high temperature superconductors. We shall also provide evidence for how EPR can zero in on irradiation-induced bond rupture at a specific single chemical bond level, pointing towards a new principle of conservation of symmetry during radiation damage.