



INSTITUTE COLLOQUIUM

INDIAN INSTITUTE OF SCIENCE
BANGALORE

PROFESSOR CHANDAN DASGUPTA
DEPARTMENT OF PHYSICS

will deliver a lecture

on

UNIVERSAL CONCEPTS IN THE THEORY OF GLASSY SYSTEMS

On Tuesday, the 29TH FEBRUARY, 2000

at 4.00 PM in the Faculty Hall

DIRECTOR

will preside

All are cordially invited.

Coffee : 5.00 PM
Reception Hall

Prof. S S KRISHNAMURTHY
Convener

ABSTRACT

Glassy systems abound in nature, the most common among them being the amorphous, solid-like, structural glass ("window glass") obtained by rapidly cooling a liquid to a temperature below the so-called "glass transition" temperature. The glassy state and the supercooled liquid state near the glass transition exhibit many interesting properties which are closely related to the complex structure of the free energy or potential energy landscape of the system. The first part of the colloquium will focus on our recent work on the topography of the free energy landscape of simple liquids near the glass transition. The relation between this description of structural glasses and theories of a large number of condensed matter systems (such as spin glasses and vortex glasses) will also be discussed.

The concepts and techniques developed in the study of glassy systems appear to be "universal" and their applicability extends far beyond the statistical physics of condensed matter systems. The second part of the colloquium will be devoted to applications of the "landscape paradigm" to a number of problems outside the domain of conventional condensed matter physics (e.g. neural networks, combinatorial optimization and protein folding).