INDIAN STATISTICAL INSTITUTE

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Theoretical Statistics and Mathematics Unit

Monday Colloquium

Date: March 10, 2025 Time: 04:15 P.M.

Venue: L-infinity, Stat-Math Unit (5th Floor, A.N. Kolmogorov Bhavan), ISI Kolkata

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TITLE:

Homotopy theory and homotopy theories

ABSTRACT:

Homotopy theory is formally the study of topological spaces or rather, continuous maps between them up to continuous perturbation: this is the basic subject of algebraic topology, which uses various algebraic structures for this purpose. However, over the years people discovered that there is more to be investigated: namely, homotopy invariants of spaces (and similar categories, such as chain complexes or DGAs) which cannot be described in terms of the homotopy category alone.

A number of approaches have been proposed for dealing with this problem: they include Quillen's model categories, Dwyer and Kan's simplicial categories and the various other forms of ∞-categories, Grothendieck and Heller's (pre)derivators, and more. However, none of these give a completely clean answer to the question of "what is a homotopy theory?" In the talk I will discuss these variants, and suggest what we need to be looking for : complete collections of meaningful homotopy invariants.

ALL ARE CORDIALLY INVITED