



Theoretical Statistics and Mathematics Unit, Kolkata
INDIAN STATISTICAL INSTITUTE

SEMINAR

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VENUE:

L- Infinity

(5th Floor, A.N. Kolmogorov Bhavan), ISI Kolkata

TITLE:

**CLASSIFYING EQUIVARIANT RATIONAL HOMOTOPY TYPE UP TO
ISOMORPHIC COHOMOLOGY DIAGRAM**

SPEAKER:

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ABSTRACT:

Algebraic models for rational homotopy theory were developed by Quillen (via differential graded Lie algebra model) and Sullivan (via commutative differential graded algebra model) and the same for equivariant rational homotopy theory were developed by Triantafillou and Scull for finite group actions and S^1 -action, respectively. They showed that given a diagram of rational cohomology algebras from the orbit category of a group G , there is a unique minimal system of DGAs (covariant functors from the orbit category of G to the category of differential graded algebras) and hence a unique equivariant rational homotopy type that is weakly equivalent to it. However, there can be several equivariant rational homotopy types with the same diagram of cohomology algebras. Halperin, Stasheff, and others, studied the problem of classifying rational homotopy types up to cohomology in the non-equivariant case.

In this talk, I will explore the equivariant version of this problem. I will focus on the case C_p (cyclic group of order prime p), and describe, under suitable conditions, when the diagram of cohomology algebras determines the equivariant rational homotopy type. Finally, drawing a parallel with the classical theory, where formality plays a crucial role, for example, in Kähler manifolds (a sketch of the proof will be given), I will discuss examples of spaces that are equivariantly formal. I will also mention some recent developments concerning $C_{\{pq\}}$ -spaces.

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