

Workshop in
Descriptive Set Theory and Model Theory
Indian Statistical Institute, Kolkata
December 27, 2012—December 31, 2013

TOPICS

Descriptive Set Theory: Polish spaces, Borel sets, cardinalities of Borel sets, Borel isomorphism theorem. Borel generated topologies, Ramsey-Mackey theorem.

Analytic and Coanalytic sets, Lusin's and Novikov's separation theorems, weak reduction principle for coanalytic sets, Lusin's and Novikov's Borel uniformization theorems.

Borel equivalence relations with emphasis on smooth and countable ones. Polish groups and their actions with emphasis on \mathbb{Z} -actions, Glimm-Effros dichotomy theorem.

Elements of Ergodic Theory.

Model Theory: Definition of first order languages, formulas, sentences and first order theories, structures and models, embeddings, elementary embeddings and isomorphisms, downward Lowenheim-Skolem theorem.

An overview of the proof of the completeness theorem for first order theories, Compactness theorem and its applications such as upward Lowenheim-Skolem theorem etc.

Quantifier elimination and model completeness, discussions on some theories such as *DAG*, *ACF*, *RCF* etc., applications in algebra such as Ax's theorem, Nullstellensatz, Chevalley's theorem, solution of Hilbert's seventeenth problem, etc.

Ax-Kochen-Ershov principle.

O-minimality and applications.