

Title: Representation theory of reductive algebraic groups: techniques and applications

The lectures will serve as an introduction to the representation theory of reductive linear algebraic groups, with the goal of illustrating techniques and applications to some ongoing research problems.

Foundational material should include: highest weight theory and irreducible modules, Weyl modules and induced modules, extension theory, dual modules, Steinberg tensor product theorem, restriction to Levi factors, weight multiplicities.

The more advanced topics will be chosen from: applications to subgroup structure of reductive groups, branching problems, and some current research directions.