



Distinguished Lecture Series - Prof. Robert M. Guralnick:

Title of Lecture I: **Derangements in permutation groups**

Monday, October 31, 2016 at 15:30

Abstract: Let G be a group acting on a set X . A derangement on X is a fixed point free permutation of X . Jordan proved already in the 1800's that derangements exist for finite transitive groups on a set of size greater than one. We will discuss some recent extensions of Jordan's result (some elementary and some not) with applications to number theory and arithmetic algebraic geometry.

Title of Lecture II: **Strongly Dense Subgroups of Semisimple Groups**

Tuesday, November 1, 2016 at 15:30

Abstract: If G is a semisimple algebraic group, we say that a Zariski dense free subgroup is strongly dense if every nonabelian subgroup is also Zariski dense. I will discuss the result of Breuillard-Green-Guralnick-Tao that over sufficiently large fields semisimple groups always contain strongly dense subgroups. I will mention applications of this to generation of finite simple groups of Lie type and expanders and to the Banach-Tarski-Hausdorff paradox. Finally, I will mention some ongoing work with Breuillard and Larson about extend the result to other fields using other methods.

Title of Lecture III: **Base Size and Generic Stabilizers**

Thursday, November 3, 2016 at 15:30

Abstract: Let G be a group acting on a set X . A base for G on X is a subset B of X so that if g in G fixes each b in B , then g fixes all elements of X . It is a classic problem in finite permutation group theory to determine the minimal base size for actions of simple (and more generally primitive groups). We will discuss the same problem for simple algebraic groups and the related problem of finding "generic" stabilizers. This will be about joint work with various collaborators (Burness, Saxl, Lawther, Garibaldi, Liebeck, Testerman).