

Titles and abstracts

1. Finite groups of Lie type

This gives an introduction to finite groups of Lie type. In particular, I will discuss the construction of these groups as subgroups of linear algebraic groups and introduce some distinguished classes of subgroups such as maximal tori and parabolic subgroups. I will also describe these groups as finite groups with BN-pairs. The material will be illustrated by explicit examples.

2. Representations of finite groups of Lie type

First, I will introduce the main notions and objectives of the representation theory of finite groups. Then I will specialize to the finite groups of Lie type, presenting a survey on some of the most prominent known results and some of the open questions. This talk does not require a deep knowledge in representation theory.

3. Branching graphs

Here, I will present some recent results and conjectures arising from joint work with Gerber and Jacon, concerned with the representations of the finite classical groups. These finite classical, for example the general linear or unitary groups, are examples of finite groups of Lie type. Restricting representations from one such classical group to the next smaller one (for example from $GL(n,q)$ to $GL(n-1,q)$) gives rise to a branching graph. In this talk I will introduce a striking connection of such branching graphs to crystal graphs arising in the representation theory of quantum algebras.