TS3: Thematic Session: Groups 3

Thursday 3 July, 14:00–16:00 • Room 103

Coen del Valle (University of St. Andrews)

Time: 14:00–14:30

Cameron's Greedy Conjecture

Let G be a group of permutations of a finite set Ω. A base for G is a subset of Ω whose pointwise stabiliser is trivial; denote the size of a smallest base for G by $b(G)$. There is a natural greedy algorithm for finding a base of relatively small size. In 1999, Peter Cameron conjectured that for G primitive, this algorithm produces bases of size at most some absolute constant multiple of $b(G)$. In this talk, we will explore recent progress towards settling this conjecture.

Claude Marion (Centro de Matemática da Universidade do Porto)

Time: 14:30–15:00

Finite and profinite groups with the Magnus Property

A group G is said to have the Magnus Property (MP) if whenever two elements $x, y \in G$ have the same normal closure, namely $\langle x \rangle^G = \langle y \rangle^G$, then x and y are conjugate or inverse-conjugate in G. In 1930 Magnus proved that every free group is MP. In the twenty first century, the study of groups with the Magnus Property gained some further interest. In this talk we investigate finite and profinite groups which are MP. This is based on joint works with Martino Garonzi and Pavel Zalesskii.

Ori Parzanchevski (The Hebrew University of Jerusalem)

Time: 15:00–15:30

Bounded cutoff on matrix groups

Answering a question of Sarnak, we construct an explicit set of generators for the groups PSL(n,q) for which the random walk exhibits total-variation cutoff with bounded window size (namely, independent of q). The construction makes use of geodesic flows on Bruhat-Tits buildings, automorphic representation theory in positive characteristic, and spectral analysis of almost-normal operators.

Marston Conder (University of Auckland, New Zealand)

Time: 15:30–16:00

Some unexpected theoretical consequences of computations involving symmetry

In this talk I will give some instances of computations involving actions of groups (on graphs and maps with a high degree of symmetry) that led to unexpected theoretical discoveries. These include discoveries about the genus spectra of particular classes of regular maps on surfaces, and a very recent one about the kinds of automorphism groups they have, and related earlier discoveries about symmetric graphs that led to new presentations for special linear groups over the integers, as well as a closed-form definition for the binary reflected Gray codes. Such examples highlight the way in which computational experiments can have surprising theoretical outcomes.
