Mini- Conference on Infinite Combinatorics 2012

LSE Mathematics Department 25th July 2012

Adam Ostaszewski, LSE

Title: Steinhaus' Theorem and its descendants

Abstract: The classical real-line Steinhaus sum-theorem that A+A contains an open set when A is large in the sense of measure or category, has generated a corpus of work which will be recalled and continues to inspire, among them results on automatic continuity in group theory and open mapping principles in analysis. Such results may be deduced from the notion of shift-compactness associated with group action. In the presence of almost completeness this property follows from the separation of points from closed nowhere dense sets by appropriate group members. Variant forms of separation may be deduced by passing to a refinement topology; thus the density topology permits measure results to follow from category results. Analyticity provides a useful mild form of completeness. Mention will be made of the relationship between this approach and the use of generic automorphisms in the sense of Truss.

Dona Strauss, Hull

Title: Chains of idempotents in beta -N (Joint work with N. Hindman and Y. Zelenyuk)

Abstract: The properties of idempotents in βS play a significant role in combinatorics. They have often provided surprisingly short proofs of important theorems - Hindman's Theorem and the Hales-Jewett Theorem are examples - and they have suggested new theorems. I shall describe what we know about idempotents in βN and talk about a new result obtained by N. Hindman, Y. Zelenyuk and myself about the existence of decreasing chains of idempotents in βN. We showed that, for every non-minimal idempotent p in βN and every countable ordinal α, there is a decreasing chain of idempotents in βN indexed by α, with p as the maximum element. Whether there are any uncountable chains of idempotents in βN is an open question.

An audio recording (with accompanying screenshots) of this presentation is available at http://richmedia.lse.ac.uk/maths/20121107_SlawomirSolecki.mp4 .

Sławomir Solecki, University of Illinois at Urbana-Champaign

Title: An abstract approach to Ramsey theory with applications

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