School of Mathematics & Statistics

Pure Mathematics Colloquium

The structure of stable sets

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15:30
Room 306 Alan Turing

Abstract:

A long-standing open problem in additive number theory is the following: how large does a set of integers have to be before it is guaranteed to contain a non-trivial arithmetic progression of length 3?

In the first half of this talk we shall survey recent progress on this problem, and the techniques used to solve it and related questions about additive structures in finite abelian groups. In particular, we shall explain the idea behind the so-called "arithmetic regularity lemma" pioneered by Green, which is a group-theoretic analogue of Szemerédi's celebrated regularity lemma for graphs.

In the second half of the talk we shall describe recent joint work with Caroline Terry (University of Chicago), which shows that under the natural model-theoretic assumption of stability the conclusions of the arithmetic regularity lemma can be significantly strengthened, leading to a characterisation of stable subsets of finite abelian groups.

This talk should be accessible to postgraduate students across all areas of mathematics.

Tea and coffee will be available in the common area from 15:00