NONSTANDARD METHODS FOR FREIMAN'S INVERSE PROBLEMS

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Topic #3: *Nonstandard methods in combinatorial number theory.*

Let A be a set of natural numbers. Freiman's inverse phenomenon indicates that if $A + A$ is "small", then A must be a "large" subset of a set with the structure of arithmetic progressions. In the talk we briefly introduce the background of Freiman's inverse problems and explain how nonstandard methods play an important role in solving these problems in various settings. Although we plan to report some recent advances on the subject, we will emphasize more on the general ideas why nonstandard methods provide advantages in dealing with Freiman's inverse problems.

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