

Nonstandard methods for additive problems in combinatorial number theory

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In the talk the speaker will introduce his recent work on some additive problems in combinatorial number theory using nonstandard analysis. He will cover the following topics:

1. Sumset phenomenon, i.e. if sets of integers A and B are large in terms of "measure" then $A + B$ is not small in term of "order-topology";
2. Buy-one-get-one-free scheme, i.e. there is a theorem for upper Banach density parallel to each existing theorem for lower asymptotic density or Shnirel'man density;
3. Inverse phenomenon: if $A + A$ is small, then A must have some arithmetic structure.