For the recent twenty years combinatorics has become one of the most rapidly evolving field of mathematics. At the beginning its development had been strictly related to its strong ties with theoretical computer science and statistical physics. Recently the great potential of the combinatorial approach has been noticed by researchers working in algebra, topology, geometric group theory, and model theory.

The main objects we study are groups (including randomly generated groups), graphs, hypergraphs (as well as random graphs) and intricate relations between these structures. The key objective of the project is to open new avenues of research, interesting from a mathematical point of view and useful for future applications, by combining techniques and heuristic from the above areas of mathematics. Our approach is strongly influenced by the probabilistic method but includes also a variety of tools borrowed from algebra, topology and logic.