

Abstract:

The past few decades have witnessed a growing interest in the theory of word maps on groups and its diverse applications. Already in the 1980s Borel studied word maps on simple algebraic groups; subsequently word maps on (nonabelian) finite simple groups were studied by many authors, focusing on word width, and inspired by the Waring problem in number theory solved by Hilbert.

A major achievement was the proof of the Ore conjecture of 1951, showing that every element of every finite simple group is a commutator. Subsequently, probabilistic aspects of word maps and probabilistic identities were thoroughly studied, with some conjectures proved and others still wide open. Finally, I will present recent solutions to analogous problems in ring theory.