

be carried out over a vast class of mathematical structures which have good logic properties of 'dependency' between elements (although the nature of this dependency could be far away from that of linear dependency in vector spaces).

Groups of finite Morley rank emerged as binding groups in Zilber's analysis of arbitrary \aleph_1 -categorical structures; this made them a focal point of model theoretic algebra. They are abstract groups equipped with a suitable notion of dimension called Morley rank on definable sets. When they are viewed as permutation groups (so have a definable faithful action), they have finite bases and allow deep structural analysis. What is important, groups of finite Morley rank were born as binding, hence permutation groups, and their study as permutation groups yields a very rich theory.

The talk will be an attempt to give a survey, at the background of rich history, of recent advances in the theory of permutation groups of finite Morley rank.

SIMPLE GROUPS OF FINITE MORLEY RANK

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One of the still unresolved questions coming from the foundations of geometrical stability theory is the algebraicity problem for simple groups of finite Morley rank. We give a broad overview of the status of that problem and touch on its connections with the theory of permutation groups of finite Morley rank, notably the problem of generic multiple transitivity.

THE COMPUTABILITY OVER ABSTRACT MODELS

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The problem of computability over abstract structures was studied in different works. First idea was to consider only countable models and interesting approach was created by definition of the computable (recursive) structures by O. Rabin, A. Frohlich and J. Shepherdson, A. Malcev. Later it was constructed different ideas to define directly construction of computability over different structures without numberings over abstract structures by Y. Moschovakis, G. Sacks, Yu. Ershov. Yu. Ershov suggested to consider from admissible theory to use some HF-superstructure over abstract model added new hereditary finite subsets and the theory of definability in this special classes of formulas. But this theory was with some problem for applications in programming and we started to constructed on this base the computability over HW-superstructures on the base hereditary finite lists. And on this base was built the theory of semantic programming and created some applications in Programming together with Yu. Ershov and D. Sviridenko and other our colleagues. The main idea was constructed programming language to create program on the base of formal specifications to solve problems of control system. One approach for research was connected with arbitrary uncountable classical mathematical structure and computability property on them. We study problems of computability and polynomial computability for abstract structures. Together with A. Nechesov we found the polynomial version of Gandy theorem and constution logic programming language for polynomial computability/ Another approach was with logical aspects in programming and The theory of semantic programming and semantic modeling were done together with Yu.L. Ershov, E.E. Vityev, D.I. Sviridenko, A. Nechesov, A. Mancivoda, V. Gumirov and others. Last time it is very interesting programming applications were done for AI and control systems by V. Gumirov, A. Mancivoda and E. Vityaev.