

Geometry, Groups and Dynamics/GEAR Seminar
(held at the Illinois hub of GEAR)

Thursday, April 2, 2015, 1:00 pm in 243 Altgeld Hall

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Complexity of finitely generated residually finite groups

Abstract: Finitely presented residually finite groups are usually thought of as nice from the algorithmic view-point, in particular, they have decidable word problem. In this talk I will address the following general questions for such groups G : how large could be the Dehn function of G ? How large could be the gap between the complexity of the word problem and the Dehn functions of G ? What is the time complexity of the classical McKinsey algorithm for the word problem in G (this is the only known uniform algorithm for the word problem in such groups)? How large could be the depth functions in G ? The depth function measures how deep one has to go into finite index subgroups to separate a non-trivial element of a given length in G from the identity. These are joint results with O. Kharlampovich and M. Sapir. I will also discuss finitely generated recursively presented residually finite groups with really strange algorithmic properties, so called Dehn monsters. To build them we need Golod-Shafarevich construction and a forcing-type argument from logic. This is based on joint results with D. Osin and B. Khousainov.

[Video](#)