Self-similar finite p-groups

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Abstract: In this talk, we address the following question: when is a finite p-group G self-similar, i.e. when can G be faithfully represented as a self-similar group of automorphisms of the p-adic tree? We show that, if G is a self-similar finite p-group of rank r, then its order is bounded by a function of p and r. This applies in particular to finite p-groups of a given coclass. In the particular case of groups of maximal class, that is, of coclass 1, we can fully answer the question above: a p-group of maximal class G is self-similar if and only if it contains an elementary abelian maximal subgroup over which G splits. Furthermore, in that case the order of G is at most p^{p+1}, and this bound is sharp.

This is joint work with A. Babai, K. Fathalikhani, and M. Vannacci.