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Almost all p -groups have automorphism group a p -group for p odd.

Many common finite p -groups admit non-trivial automorphisms of order coprime to p . However when p is odd, it is reasonably difficult to find finite p -groups with automorphism group a p -group. I'll talk about joint work with Ursula Martin proving that almost all finite p -groups do have automorphism group a p -group when p is odd. The asymptotic sense in which the theorem holds involves bounding the Frattini length of the p -groups and letting the number of generators go to infinity. The proof of the theorem draws on a detailed analysis of the Frattini series of a free group and the combinatorics linking finite p -groups and representations of $GL_n(p)$. The case of $p = 2$ remains open.