Geometry, Topology and Dynamics Seminar

Cantor dynamics of renormalizable groups

Steve Hurder (UIC)

Abstract: A group G is said to be finitely non-co-Hopfian, or renormalizable, if there exists a self-embedding f: G -> G whose image is a proper subgroup of finite index. Such a proper self-embedding is called a renormalization for G. A basic question about renormalizable groups is whether they must be virtually nilpotent, assuming that the intersection of the iterated images f^n(G) is a finite group? Nekrashevych and Pete gave examples of renormalizable groups satisfying this condition that are not virtually nilpotent, and so the answer to the question is negative.

In this work, we introduce a profinite group H naturally associated to a renormalization, and show that the renormalization induces an open embedding h : H -> H, then show that if the intersection of the iterated images h^n(H) is a finite group, then G must be virtually nilpotent. Our approach is to associate a Cantor dynamical system to a renormalization of G, whose discriminant invariant is a profinite group which is a measure of the ''asymmetries'' of the dynamical system. A main technical result identifies this discriminant group with the intersection of the iterated images h^n(H). Work of Reid is then used to show that G must be virtually nilpotent if the discriminant group is finite.

This is joint work with Olga Lukina (University of Vienna) and Wouter Van Limbeek (UIC).

Monday, March 9 at 3:00 PM in 636 SEO