Gidi Amir - The Liouville property for groups acting on rooted trees

We show that on groups generated by bounded activity automata, every symmetric, finitely supported probability measure has the Liouville property. This gives a partial answer to a conjecture in [AAV13]. The proof generalizes also to similar groups acting on spherically homogeneous rooted trees.

Agnieszka Bier - Verbal subgroups in groups of infinite matrices

Abstract

This is a summary on verbal subgroups in the groups $T(\infty, K)$ and $UT(\infty, K)$ of infinite dimensional triangular and unitriangular matrices over a field K, $|K| > 2$. The characterization of the lattices of verbal subgroups in these groups is presented, and the width of verbal subgroups generated by non-commutators, powers and (generalized) Engel words is given [2, 3, 4].

The groups $T(\infty, K)$ and $UT(\infty, K)$ may be defined as limits of inverse systems of groups of finite dimensional matrices. The described results are deduced from the respective characterization for the finite dimensional case [1] and some properties of the inverse limit topology [5].

References

[1] A. Bier, "Verbal subgroups in the group of triangular matrices over field of characteristic 0", J. Algebra 321, 2 (2009), p.483–494

[2] A. Bier, "The width of verbal subgroups in groups of unitriangular matrices over a field", Int. J. Alg. Comput. 22, 3 (2012), p.1250019

[3] A. Bier, "On solvability of Engel equations in the group of triangular matrices over a field", Linear Algebra Appl.438 (2013) p.2320–2330

[4] A. Bier, "Commutators and powers of infinite unitriangular matrices", Linear Algebra Appl. 457 (2014) p. 162–178

[5] A. Bier, "On lattices of closed subgroups in the group of infinite triangular matrices over a field", preprint

Jean-Baptiste Boyer - Linear random walk on the torus

Let rho be a measure on $SL_d(Z)$ that we consider as acting on the torus $T^d = R^d/Z^d$. We assume that rho has an exponential moment and thag the group generated by the support of rho is Zariski dense in SL_d and we study the walk on the torus associated to rho. I will first state the theorem of Bourgain, Furman, Lindendtrauss and Mozes about the equidistribution of the walk and the classification of the stationary measures and then state the result by Bourgain and Varju that proves that there is a uniform spectral gap in the L^2 of the stationary measures (or in other words, that the family of graphs $(SL_d(Z/qZ), pi_q(S))$ is an expander (where S stands for the support of rho and Pi_q is the projection on $SL_d(Z/qZ)$). Finally, I will explain the subject of my thesis : the central limit theorem for the this random walk.

Henry Bradford - Uniform Diameter Bounds in Groups

We give new upper bounds for the diameters of finite groups which do not depend on a choice of generating set. Our method exploits the commutator structure of certain profinite groups, in a fashion analogous to the Solovay-Kitaev procedure from quantum computation. We obtain polylogarithmic upper bounds for the diameters of finite quotients of groups with an analytic structure over a pro-p domain, and the Nottingham group of a finite field.

Mike Cantrell - Asymptotic Shape of Equivariant Random Metrics on Nilpotent Groups

We present three seemingly different results about randomness in a finitely generated nilpotent group: an asymptotic shape theorem for First Passage Percolation (FPP); a generalization to random metrics of Pansuâ̌Źs theorem that the unique asymptotic cone of a nilpotent group is a particularly nice nilpotent Lie group; a Subadditive Ergodic Theorem for nilpotent groups. The results are all related, and the proof involves sub-Riemannian geometry and Ergodic Theory.

Tullio Ceccherini-Silberstein - Multipass automata and group word problems

In a joint work with Michel Coornaert, Francesca Fiorenzi, Paul E. Schupp, and Nicholas W. M. Touikan, we introduce the notion of multipass automata as a generalization of pushdown automata and study the classes of languages accepted by such machines. The class of languages accepted by deterministic multipass automata is exactly the Boolean closure of the class of deterministic context-free languages while the class of languages accepted by nondeterministic multipass automata is exactly the class of poly-context-free languages, that is, languages which are the intersection of finitely many context-free languages. We illustrate the use of these automata by studying groups whose word problems are in the above classes.

Max Chorniy - Simplicity and finite generation of the commutator subgroup of d minimal subshifts

The aim of the work is to prove that the commutator subgroup of $d \geq 2$ pairwise commuting Cantor minimal subshifts (more precisely, homeomorphisms conjugate to minimal subshifts) is simple and finitely generated.
Furthermore, we describe a partial case of interval exchange transformation groups and show its connection to full topological groups. The main result is that the commutators of certain interval exchange groups are simple and finitely generated.
As for the flight, I have booked a multiticket Chicago-Paris-Kyiv-Chicago. My flight back to Chicago is on September 17 and, as Kate told me, it cannot be reimbursed. Two other flights are right before and after the conference. The total cost is around 1100. Which part of the payment can be reimbursed in this case?The aim of the work is to prove that the commutator subgroup of $d \geq 2$ pairwise commuting Cantor minimal subshifts (more precisely, homeomorphisms conjugate to minimal subshifts) is simple and finitely generated.
Furthermore, we describe a partial case of interval exchange transformation groups and show its connection to full topological groups. The main result is that the commutators of certain interval exchange groups are simple and finitely generated.

Corina Ciobotaru - Strongly transitive actions on affine ordered hovels

A hovel is a generalization of the Bruhat–Tits building that is associated to an almost split Kac–Moody group G over a field K. In particular, G acts strongly transitively on its corresponding hovel Δ as well as on the building at infinity of Δ, which is the twin building associated to G. In this paper we study strongly transitive actions of groups that act on affine ordered hovels Δ and give necessary and sufficient conditions such that the strongly transitive action on Δ is equivalent to the strongly transitive action of the group on its building at infinity $\partial\Delta$. Along the way a criterion for strong transitivity is given and the cone topology on the hovel is introduced. We also prove the existence of strongly regular hyperbolic automorphisms of the hovel, obtaining thus good dynamical properties on the building at infinity $\partial\Delta$.

Antoine Clais - Combinatorial modulus on boundaries of right-angled hyperbolic buildings

It is known since G.D Mostow that the quasi-conformal structure of the boundary of a hyperbolic space can be used to obtain rigidity results. In the case of right-angled buildings of dimension 2, the Loewner property is a key tool to prove the rigidity of quasi-isometries. Hence a natural question to ask is: do some boundaries of buildings of dimension 3 carry the Loewner property?
The combinatorial Loewner property is a discrete version of the Loewner property that is conjecturally equivalent to it. Yet this second property seems easier to find on the boundary of a hyperbolic group as it do not require the computation of the conformal dimension.
In my Ph.D thesis I investigated the quasi-conformal structure of right-angled hyperbolic buildings of dimension 3 thanks to combinatorial tools. As a result I found some buildings whose boundaries satisfy the Combinatorial Loewner property.

David Cohen - The large scale geometry of strongly aperiodic subshifts of finite type.

We discuss how the geometry of a group G constrains the possible dynamical properties of subshifts of finite type on G.

Michal Ferov - Separability properties of automorphisms of graph products of groups

We study properties of automorphisms of graph products of groups. We show that graph product has non-trivial pointwise inner automorphisms if and only if some vertex group corresponding to a central vertex has non-trivial pointwise inner automorphisms. We use this result to study residual finiteness of outer automorphism groups. We show that if all vertex groups are finitely generated residually finite and the vertex groups corresponding to central vertices satisfy certain technical (yet natural) condition, then the outer automorphism group is residually finite. Finally, we generalise this result to graph products of residually p-finite groups to show that if G is a graph product of finitely generated residually p-finite groups such that the vertex groups corresponding to central vertices satisfy the p-version of the technical condition then Out(G) is virtually residually p-finite. We use this result to prove bi-orderability of Torreli groups of some graph products of finitely generated residually torsion-free nilpotent groups.

Lizzy Frenkel - Cones and thick monoids in free groups

We investigate the special automata over finite rank free groups and estimate asymptotic characteristics of sets they accept. We show how one can decompose an arbitrary regular subset of a finite rank free group into disjoint union of sets accepted by special automata. These automata allow us to compute explicitly generating functions, and some other asymptotic characteristics of regular subsets in free groups.

Alejandra Garrido - The congruence subgroup property for groups acting on trees

Krishnendu Gongopadhyay - Palindromic Width in Groups.

I shall give a summary of the literature on palindromic widths in groups. The survey is based on the author's joint work with Valeriy Bardakov. We shall also pose a few open problems related to the topic.

Haydor Goral - Mann Property and Interpretable Groups

In this poster, we study the pair (K,G) where K is an algebraically closed field and G is a multiplicative subgroup of K* with the Mann property. The main examples of this property comes from number theory. For instance, H. Mann proved that the roots of unity has the Mann property. The theory of the pair is axiomatised by L. van den Dries and A. GÃijnaydÄśn and they prove that the pair (K,G) is stable. In the poster, we give the characterisation of interpretable groups in (K,G) and the tools in order to prove it.

Jordan Greenblatt - Maximal Bounds on Cartesian Powers of Finite Graphs

Be'eri Greenfeld - Chains of Prime Ideals and Primitivity of Z-Graded Algebras

In this paper we provide some results regarding affine, prime, Z -graded algebras R generated by elements with degrees 1,âĹŠ1 and 0, with R 0 finite-dimensional. The results are as follows. These algebras have a classical Krull dimension when they have quadratic growth. If R k âĽ0 for almost all k then R is semiprimitive. If in addition R has GK dimension less than 3 then R is either primitive or PI. The tensor product of an arbitrary Brown-McCoy radical algebra of Gelfand Kirillov dimension less than three and any other algebra is Brown-McCoy radical.

Ben Hayes - Fuglede-Kadison determinants and Sofic Entropy

We related Fuglede-Kadison determinants to entropy of finitely-presented algebraic actions in essentially complete generality. We show that if $f \in M_{m;n}(\mathbb{Z}(\Gamma))$ is injective as an operator on $\mathcal{L}^2(\Gamma)$, then the topological entropy of the action of Γ on the dual of $\mathbb{Z}(\Gamma)^{\rtimes n}/\mathbb{Z}(\Gamma)^{\rtimes f}$ is at most the logarithm of the positive Fuglede-Kadison determinant of f; with equality if m = n: We also prove that when m = n then the measure-theoretic entropy of the action of ôĂĂĂ on the dual of $\mathbb{Z}(\Gamma)^{\rtimes n}/\mathbb{Z}(\Gamma)^{\rtimes f}$ is the logarithm of the Fuglede-Kadison determinant of f: This work completely settles the connection between entropy of principal algebraic actions and Fuglede-Kadison determinants in the generality

in which dynamical entropy is defined. Our main Theorem partially generalizes results of Li-Thom for amenable groups to sofic groups. Moreover, we show that the obvious full generalization of the Li-Thom theorem for amenable groups is false for general sofic groups. Lastly, we undertake a study of when the Yuzvinskii addition formula fails for a non-amenable sofic group Γ, showing it always fails if Γ contains a nonabelian free group, and relating it to the possible values of L^2-torsion in general.

Thomas Ibarlucia - The Fourier–Stieltjes algebra of oligomorphic groups (via model-theory)

.

We give different topological and model-theoretic characterizations of the family of oligomorphic groups whose Fourier–Stieltjes algebra is dense in the algebra of weakly almost periodic functions. Based on joint work with ItaÃŕ Ben Yaacov and Todor Tsankov.

Ainhoa Iniguiez - Word fibres in finite groups

Let G be a finite group and let w be a word in k variables. We write $Pw(g)$ the probability that a random tuple $(g1; \ldots; gk) \in G(k)$ satifies $w(g1; \ldots; gk) = g$. For non-solvable groups, it is shown in [1] that $Pw(1)$ can take arbitrarily small values as $n \to \infty$. In [4] they prove that for any finite group, G is solvable if and only if Pw(1) is positively bounded from below as w ranges over all words. And G is nilpotent if and only if Pw(g) is positively bounded from below as w ranges over all words that represent g. Alon Amit conjectured in [2] that in the specific case of finite nilpotent groups and for any word, $Pw(g) \geq 1 = 1/|G|$. It is easy to see that it holds for finite abelian groups. Note that it will suffice to prove the conjecture when G is a p-group for some prime p. We can also consider $Nw(g) = |G|^k \cdot Pw(g)$, the number of solutions of $w = g$ in $G^{(k)}$. Note that Nw is a class function, and hence $Nw = \sum_{\chi \in Irr(G)} N_\omega^\chi \cdot \chi$. We prove that if G is a finite p-group of nilpotency class 2, then Nw is a generalized character. What is more, if p is odd, then Nw is a character and for 2-group we can characterize when Nx2r is a character. As a consequence, we prove the conjecture of A. Amit for finite groups of nilpotency class 2. This result was indepently proved by M. Levy in [3]. What is more, we prove that for any word w and any finite p-group of class two and exponent p, $Pw(g) \geq 1 = |G|$ for $g \in Gw$. As far as we know, A. Amit's conjecture is still open for higher nilpotency class groups. For p-groups of higher nilpotency class, we find examples of words w for which Nw is no longer a generalized character. What is more, we find examples of non-rational words; i.e there exist finite p-groups G and words w for which g 2 Gw but gi 62 Gw for some (i; p) = 1.

Ivanov-Pogodaev - Construction of infinite finitely presented nilsemigroup

The talk deals with the solution of Shevrin ans Sapir problem. We construct Infinite finitely presented nilsemigroup with identity $x^9 = 0$. The new method of construction is based on aperiodic tilings, Goodman-Strauss-type theorems on uniformly elliptic space. Space is called *uniformly elliptic* iff there is universal constant Îż¿0 such that any two points A and B on distant D can be joined by family of geodesic lines generating a disc of wideness ÎżâŃĚD. Any defining relation in the semigroup corresponds to local equvalence of two paths on constructed space. Research was supported by the grant RFBR N 14-01-00548.

Delaram Kahrobaei - A family of polycyclic groups over which the conjugacy problem is NP-complete

In this paper we study the conjugacy problem in polycyclic groups. Our main result is that we construct polycyclic groups Gn whose conjugacy problem is at least as hard as the subset sum problem with n indeterminates. As such, the uniform conjugacy problem over the groups Gn is NP-complete where the parameters of the problem are taken in terms of n and the length of the elements given on input.

Alexey Kanel-Belov - Construction of infinite finitely presented nilsemigroup

Let G be a finitely generated group of period n. Is it finite? It is true for n=1,2,3,4,6; counter examples are known: for all odd numbers greater than 665 (P.Novikov S. Adyan, recently S.Adyan claimed 101); even numbers : greater than several thousands (S.Ivanov, A.Lyseonok). A.Yu. Olshansky and Rips and Gromov provided geometrical methods, based on Van Campen diagram mosaics.. Connections between group relations and tilings investigated by J.Conway in the set of papers. Remark. Nothing is known for n=5!

Roman Kogan - Computational Explorations in n-dimensional Thompson Groups

n-dimensional Thompson groups were introduced by Matthew Brin and are natural generalizations of the Thompson Group V acting on C^n, where C is the Cantor set. A computational package has been developed which allows one to perform basic computations in these groups (group operations, word problem), visualize elements in 2V, and directly compute the growth function γ_n (e.g of Thompson group F) for small values of n. The poster describes the algorithmic aspects of these computations.

Marcin Kotowski - Dyson's spike for random Schroedinger operators and Novikov-Shubin invariants of groups

We study Schroedinger operators with random edge weights and their expected spectral measures μ_H near zero. We prove that the measure exhibits a spike of the form $\mu_H(âĹŠ\epsilon, \epsilon) \sim |\log \epsilon|^2$ (first observed by Dyson), without assuming independence or any regularity of edge weights. We also identify the limiting local eigenvalue distribution, which is different from Poisson and the usual random matrix statistics. We then use the result to compute Novikov-Shubin invariants for various groups, including lamplighter groups and lattices in the Lie group Sol.

Michal Kotowski - Non-Liouville groups with return probability exponent at most 1/2

We construct a finitely generated group G without the Liouville property such that the return probability of a random walk satisfies $p_{2n}(e,e) \geq eâĹŠn^{1/2}+o(1)$. Recent results suggest that 1/2 is indeed the smallest possible return probability exponent for non-Liouville groups. Our construction

is based on permutational wreath products over tree-like Schreier graphs and the analysis of large deviations of inverted orbits on such graphs. Joint work with Balint Virag.

Rostyslav Kravchenko - A classification of characteristic measures on infinite dimensional torus through Fourier analysis

We provide an alternative proof for classification for characteristic measures on infinite dimensional torus, using methods of abstract Fourier analysis.

Waltraud Lederle - Topological Full Groups of Tree Actions

The topological full groups of group actions on the Cantor set has led to interesting examples of groups, e.g.
nitely generated in
nite simple amenable groups (Juschenko-Monod) and locally compact simple groups without lattices (Bader-Caprace-Gelander-Mozes). Studying topological full groups algebraically was initiated by Matui, who obtained many results re- garding simplicity of the commutator subgroup and the structure of the abelianization,
nite generation, non-amenability, to mention just a few. I focus mainly on subgroups of tree automorphism groups acting on the boundary of the tree. I am interested in the question which algebraic prop- erties of the topological full group we can deduce from properties of the group acting and what other interesting examples there are to
nd.

Matthew Levy - Fibres of certain word maps over p-groups

In [1] O'Brien and Voll use the Kirillov Orbit Method to enumerate the irreducible complex characters of finite p-groups of nilpotency class less than p. They achieve this by describing the number of characters of a group in terms of the number of rational points of certain algebraic varieties. In this paper we adapt their methods to enumerate the fibres of certain word maps over p-groups of class less than p. We also give some examples.
[1] O'Brien and Voll; Enumerating classes and characters of p-groups; Trans. Amer. Math Soc. 2015

Constantine Medynets - Presentations of topological full groups

We describe defining relations for the commutator subgroups of topological full groups of minimal subshifts. We establish that the world problem in a topological full group is solvable if and only if the language of the underlying subshift is recursive. It is a joint work with R.I. Grigorchuk.

Vahagn Mikaelian - Classification for product varieties generated by wreath products of groups

The first aim of this communication is to presents our very recent work [5] in which we suggest a general criterion, under which the equality

$$\mathrm{var}\,(A\,\mathrm{wr}\,B) = \mathrm{var}\,(A)\,\mathrm{var}\,(B) \qquad\qquad (*)$$

holds for the given finite groups A and B. Above under wreath product "wr" we understand standard direct wreath product, although the criterion is true for cartesian wreath product also. Theorem 1 in [5] states, that $(*)$ holds for finite groups A and B if and only if:

1. the exponents of group A and B are coprime;

2. A is a nilpotent group, B is an abelian group;

3. B contains a subgroup, isomorphic to the direct product C_n^c of c copies of cycle C_n, where c is the nilpotency class of A, and n is the exponent of B.

This continues our work of [1]–[4], where we give the classification of all cases when $(*)$ holds for (not necessarily finite) abelian groups.

An interesting fact, providing extra motivation to this study, is the theorem of A.L. Shmel'kin, who proved, that the product $\mathfrak{U}\mathfrak{V}$ of non-trivial varieties can be generated by a finite group if and only if the exponents of $\mathfrak{U}$ and $\mathfrak{V}$ are non-zero and coprime, $\mathfrak{U}$ is a nilpotent variety, and $\mathfrak{V}$ is an abelian variety [7, Theorem 6.3]. Since $A\operatorname{wr}B$ is finite for any finite A and B, we just have to find out those pairs of nilpotent groups A and of abelian groups B, which satisfy the criterion of Shmel'kin, and for which $A\operatorname{wr}B$ generates $\operatorname{var}(A)\operatorname{var}(B)$.

Our second aim is to consider equality $(*)$ for pairs of not necessarily finite or abelian groups. This research is not yet completed, but we can already cover the cases when:

1. A is any (possibly infinite) nilpotent group of finite exponent,

2. B is any (possibly infinite) abelian group.

The technics we use is based on critical groups, Cross varieties, wreath products, verbal wreath products, etc. Their definitions and description can be found in [6].

References

[1] V.H. Mikaelian, *On varieties of groups generated by wreath products of abelian groups*, Abelian groups, rings and modules, Contemp. Math., 273, Amer. Math. Soc., Providence, RI (2001), 223–238.

[2] V.H. Mikaelian, *On wreath products of finitely generated abelian groups*, Advances in Group Theory, Aracne, Roma, 2003, 13–24.

[3] V.H. Mikaelian, *Metabelian varieties of groups and wreath products of abelian groups*, Journal of Algebra, 2007 (313), 2, 455–485.

[4] V.H. Mikaelian, *Varieties generated by wreath products of abelian and nilpotent groups* (Russian and English), Algebra i Logika, accepted for publication, to appear in 2015.

[5] V.H. Mikaelian, *The Criterion of Shmel'kin and Varieties Generated by Wreath Products of Finite Groups*, Submitted to publication, available at arXiv.org 1503.08474.

[6] Hanna Neumann, *Varieties of Groups*, Varieties of groups (Ergebn. Math. Grenzg., 37), Berlin-Heidelberg-New York, Springer-Verlag, 1967.

[7] A.L. Shmel'kin, *Wreath products and varieties of groups*, Izv. AN SSSR, ser. matem., 29 (1965), 149–170 (Russian).

Masato Mimura - Strong algebraization of fixed point properties

A purely algebraic criterion of fixed point properties under relative fixed point property, inspired from Shalom's one in ICM 2006, is established. No bounded generation is imposed. One application is that Steinberg groups St(n,A) over any finitely generated, unital, commutative, and associative ring A, possibly noncommutative, enjoy the fixed point properties with respect to any noncommutative Lp-space, provided that n at least 4 and that p in (1,infty). This work is related to the talk by Mikhail Ershov in the present conference.

Ivan Mitrofanov - Some algorithmic problems for substitution dynamical systems.

We consider morphic words of form $h(\varphi^\infty(a))$. We discuss some solved and unsolved algorithmic problems related to morphic sequences, such as equality of two given sequences, periodicity of a given sequence, language equality and so on.

Atefeh Mohajeri - SLP compression for solutions of equations with constraints in hyperbolic groups

This work is motivated by the conjecture that the problem of satis
ability of a system of equations in a free group (hyperbolic or even toral relatively hyperbolic group) is NP-complete. We study compression of solutions with straight-line programs (SLPs) as suggested originally by Plandowski and Rytter in the context of a single word equation. We show compression results for Boolean formula of equations over a torsion- free δ-hyperbolic group with semi-linear conditions such as alphabetic con- straints. We also show similar compression results for toral relatively hyperbolic groups using the work of Dahmani. This presentation is based on a joint work with Volker Diekert and Olga Kharlampovich. 1

Aglaia Myropolska - Nielsen equivalence in MN-groups

Various aspects of geometric group theory motivate the study of the natural action of $Aut(F_n)$ on the set $Epi(F_n, G)$ of generating n-tuples of a group G generated by at least n elements. The orbits of this action are called Nielsen equivalence classes. One of the main questions, raised in the context, is the transitivity of this action.
We study transitivity properties of the $Aut(F_n)$ action in the class of groups having all maximal subgroups normal. This class, which we call MN, includes nilpotent groups as well as some infinite torsion groups acting on rooted trees, such as the Grigorchuk group and the Gupta-Sidki groups.

Iurii Shyshatskyi - tba

Rizos Sklinos - model theoretic aspects of hyperbolic groups

Krzysztof Swiecicki - Helly's theorem for systolic complexes

Alexey Talambutsa - Minimal exponential growth rates of metabelian Baumslag-Solitar groups and wreath products

We prove that for any prime $p \geq 3$ the minimal exponential growth rate of the Baumslag-Solitar group $BS(1,p)$ and the wreath product $\mathcal{L}_p = (\mathbb{Z}/p\mathbb{Z}) \wr \mathbb{Z}$ are equal. We also show that for $p = 2$ this claim is not true and the growth rate of $BS(1,2)$ is equal to the positive root of $x^3 - x^2 - 2$, whilst the one of lamplighter group $\mathcal{L}_2$ is equal to the golden ratio $(1 + \sqrt{5})/2$. The latter value also serves to show that the lower bound by A. Mann (*The growth of free products*, Journal of Algebra 326, no. 1 (2011)) for the growth rates of non-semidirect HNN-extensions is best possible.

Audrey Vonseel - Word hyperbolic groups and zeta function

The efficiency of the combinatorial methods is seen, for instance, in A. Manning's proof [Man71] of Smale's conjecture on the rationality of the zeta function which counts periodic orbits of every Bowen-hyperbolic Z-action and J.W. CannonâĂŹs proof [Can84] of the rationality of the counting function which counts elements of length k for fundamental groups of manifolds of negative curvature. As the coding provides a means of detecting the presence of orbits with specified properties such as periodicity, this approach is used by M. Gromov on hyperbolic groups in [Gro87].

Phillip Wesolek - Elementary amenable groups and descriptive set theory

The space of marked groups is a natural compact Hausdorff space that parametrizes all countable groups. We show the collection of elementary amenable marked groups is not a Borel set in the space of marked groups; we show this is also the case in the space of finitely generated marked groups. Our proof gives a chain condition equivalent to elementary amenability and two new invariants of elementary amenable groups. As a corollary, we obtain a non-constructive proof of the existence of amenable, non-elementary amenable groups. (Joint with Jay Williams)

Tianyi Zheng - Random walks and isoperimetric profiles under moment conditions

Let G be a finitely generated group equipped with a finite symmetric generating set and the associated word length function — Âů —. We study the behavior of the probability of return for random walks driven by symmetric measures Îij that are such that ÏĄ(—x—)Îij(x) ¡ âĹđ for increasing regularly varying or slowly varying functions ÏĄ, for instance, s âĘŠ (1+s)Íś, Íś âĹĹ (0,2], or s âĘŠ (1+log(1+s))oÌĺ, oÌĺ ¿ 0. For this purpose we develop new relations between the isoperimetric profiles associated with different symmetric probability measures. These techniques allow us to obtain a sharp L^2-version of ErschlerâĂŹs inequality concerning the FÃÿlner functions of wreath products. Examples and assorted applications are included. Joint work with Laurent Saloff-Coste.