Talks and abstracts

Abert, Miklos

On Invariant Random Subgroups and Benjamini-Schramm convergence

An invariant random subgroup (IRS) of a group is a random subgroup with a conjugacy-invariant distribution. IRS-es can be used to encode the stabilizer structure of measure preserving actions and in many senses, they tend to behave like normal subgroups. On the other hand, they also carry geometric information and weak convergence of IRS-es translates to a stochastic sampling convergence that has been introduced by Benjamini and Schramm for finite graphs. In the talk I will introduce IRS-es and present recent results.

Bridson, Martin

Decision problems for discrete and profinite groups

Henry Wilton and I recently proved that there is no algorithm that can determine, given a finite presentation, whether or not the group presented has a non-trivial finite quotient. I shall sketch the proof and describe some of the ramifications of this result.

Capraro, Valerio

A construction of groups preserving hyperlinearity.

The notion of hyperlinear groups has been introduced by Radulescu in 2000 in relation to Connes' Embedding Conjecture. The algebraic version of Connes' embedding conjecture states that every countable group is hyperlinear. Looking for a counterexample in the setting of uncountable group having the same cardinality of the real numbers, Radulescu proposed the question: Is the free group on uncountable many generators hyperlinear? In this talk I present a construction that, starting from a countable group, allow to obtain a family of countable and uncountable new groups. This construction preserves hyperlinearity and it has been used by L. Paunescu and myself to answer in the affirmative Radulescu's question about the hyperlinearity of the free groups on uncountable many generators.

Cornulier, Yves

Monster polycyclic groups?

It is a classical result that groups with simply connected asymptotic cones have a polynomial Dehn function, and many examples illustrate the converse, which was refuted by Bridson. We show that counterexamples to the converse can be found within the class of polycyclic groups. (Joint with Tessera)

Coulon, Rémi

Growth and order of automorphisms of free groups and free Burnside groups.

The free Burnside group of rank r and exponent n denoted by B(r,n) is the quotient of the free group of rank r by the subgroup generated by all n-th powers. We will discuss some properties of the outer automorphism group of B(r,n). In particular we build a link between the growth of an automorphism of thee free group and its order as automorphism of B(r,n). (Joint work with Arnaud Hilion.)

Delzant, Thomas

Kähler groups, real hyperbolic spaces and the Cremona group

Generalizing a classical theorem of Carlson and Toledo, we prove that any Zariski dense isometric action of a Kähler group on the real hyperbolic space of dimension at least 3 factors through a homomorphism onto a cocompact discrete subgroup of PSL(2,R). We also study actions of Kähler groups on infinite dimensional real hyperbolic spaces, describe some exotic actions of PSL(2,R) on these spaces, and give an application to the study of the Cremona group.^

Felshtyn, Alexander

R∞- groups and C*-simple groups

It is important to describe the class of groups G, such that the Reidemeister number $R(\Phi) = \infty$ for any automorphism $\Phi : G \to G$. We say that a group G has property R∞ if any its automorphism Φ has $R(\Phi) = \infty$. The work of discovering which groups belong to the mentioned class of groups was begun by Fel'shtyn and Hill in 1992. Later, it was shown by various authors that the following groups belong to this class : (1) non-elementary Gromov hyperbolic groups, (2) Baumslag-Solitar groups $BS(m; n) = \langle a,b|ba^m b^{-1} = a^n \rangle$ except for BS(1; 1), (3) the R. Thompson group F, (4) saturated weakly branch groups (including the Grigorchuk group and the Gupta-Sidki group), (8) mapping class groups, symplectic groups and braids groups, (9) relatively hyperbolic groups, (10) some classes of finitely generated free nilpotent groups and some classes of _nitely generated free solvable groups, (11) some classes of crystallographic groups.

Juhasz, Arye

The Combinatorics of Engel Words

Let n be a natural number and let F be a free group. An n-Engel word in F is obtained by applying commutation operation by one element successively n times on another element. We shall consider Engel words as relators of group presentations. A group G is an n-Engel group if every pair of elements satisfies the n-Engel relation.
In a recent work in progress by E. Rips, which aims at constructing a finitely generated n-Engel group for large enough n, which is not locally nilpotent, a new kind of canonical representative of elements is introduced which has particularly nice properties. Combinatorial properties of Engel-relators are needed for the construction of these canonical representatives. Combinatorial properties of Engel relators are also used for the application of this new canonical form.
In the present talk, these combinatorial properties are described. The talk is based on joint work with Donald J. Collins

Kharlampovich, Olga

Definable subsets in a free group (joint with A. Myasnikov)

We give a description of definable subsets in a free non-abelian group F that follows from our work on the Tarski problems.
As a corollary we show that proper non-abelian subgroups of F are not definable (Malcev's problem) and prove Bestvina and Feighn's result that definable subsets in a free group are either negligible or co-negligible.

Khukhro, Ana

Box spaces, group extensions and coarse embeddings into Hilbert space

We investigate how coarse embeddability of box spaces into Hilbert space behaves under group extensions. In particular, we prove a result which implies that a semidirect product of a finitely generated free group by a finitely generated residually finite amenable group has a box space which coarsely embeds into Hilbert space. This provides a new class of examples of metric spaces with bounded geometry which coarsely embed into Hilbert space but do not have property A, generalising the example of Arzhantseva, Guentner and Spakula.

Miasnikov, Alexei

Dehn Monsters

I will discuss new types of finitely generated recursively presented groups G with undecidable Word Problem, called Dehn monsters. In fact, the Word Problem is so bad in these groups that there is no any algorithmic way to produce an innite set of pairwise distinct elements of G.
We use Golod-Shafarevich construction and immune sets from the classical recursion theory to build Dehn monsters.

Minasyan, Ashot

Residual finiteness of outer automorphism groups

Let G be a finitely generated group. We will discuss various approaches for proving that Out(G) is residually finite, starting with a classical theorem of Grossman that Out(G) is residually finite when G is free, and proceeding to more recent results about Out(G) when G is a hyperbolic or a relatively hyperbolic group. The main part of the talk will be based on a collaboration with Gilbert Levitt.

Mozes, Shahar

A locally compact simple group with no lattices

Muranov, Alexey

Boundedly generated groups and small-cancellation method.

A group is called boundedly generated if it is the product of a finite sequence of its cyclic subgroups.
Bounded generation is a property possessed by finitely generated abelian groups and by some other linear groups.
Apparently it was not known before whether all boundedly generated groups are linear.
Another question about such groups has also been open for a while:
If a torsion-free group G has a finite sequence of generators
$a_1,\dotsc,a_n$ such that every element of G can be written in a unique way as $a_1^{k_1}\dotsm a_n^{k_n}$,
where $k_i\in\mathbb Z$, is it true then that G is virtually polycyclic?
(Vasiliy Bludov, Kourovka Notebook, 1995.)
Counterexamples to resolve these two questions have been constructed using small-cancellation method of combinatorial group theory.
In particular boundedly generated simple groups have been constructed.

Olshanskii, Alexander

Some monster actions of free and hyperbolic groups

Osin, Denis

Introductory talk: Asymptotic cones of finitely generated groups

Groups with hyperbolically embedded subgroups.

I will survey some recent results and open questions about groups with hyperbolically embedded subgroups. The talk is based on a joint work with F. Dahmani and V. Guirardel.

Peterson, Jesse D

W*-Superrigidity

Given an action of a countable group by measure preserving transformations on a probability space, we say that the action is W*-superrigid if the conjugacy class of the action can be recovered from the isomorphism class of the group-measure space von Neumann algebra. W*-superrigidity is a very strong property implying in particular orbit equivalent superrigidity where we can recover the conjugacy class of the action from its orbit structure. Actions which are W*-superrigid have only recently been shown to exist. We will present an overview of these recent W*-superrigidity results.

Rémy, Bertrand

Simple and non-simple groups acting on buildings, overview and open questions

We will review results on simplicity for groups acting on buildings; we will also mention some yet unsolved problems, in particular dealing with the case of trees.

Schroeder, Viktor

Moebius structure on the boundary of hyperbolic groups

Spakula, Jan

Coarse amenability and coarse embeddings

A deep result of G. Yu states that if a metric space of bounded geometry coarsely embeds into a Hilbert space, it satisfies the Coarse Baum-Connes conjecture. Yu devised another property - coarse amenability, or "property A" - as a criterion for coarse embeddability into a Hilbert space. In this talk, I will describe a construction of a metric space with bounded geometry which coarsely embeds, but is not coarsely amenable. A non-bounded geometry example (quite different from ours) was found previously by P. Nowak. This is a joint work with G. Arzhantseva and E. Guentner.

Strebel, Ralph

Sigma-invariants and their applications

The Sigma-invariants are subsets of a sphere S(G) attached to a finitely generated group G. The points of the sphere parametrize certain submonoids of the group and each invariant lists those submonoids for which a property, valid for all of G, continues to be valid. (…) I shall explain the history of the Sigma-invariants in some detail, describe their computation for various classes of groups, and discuss some applications.

Swiatkowski, Jacek

A degree of topological complexity for Gromov boundaries of hyperbolic groups.

Gromov boundaries of hyperbolic groups, as topological spaces, fall into a class of spaces called Markov compacta. In the talk I will introduce some degree of complexity for Markov compacta. I will discuss some properties of this degree, and some open problems that it brings in the context of hyperbolic groups.

Thom, Andreas

Introductory talk: von Neumann algebras and l2-Invariants

Determinants, Entropy and l2-Torsion

I will present recent progress on questions asked by Deninger about the entropy of certain algebraic dynamical systems. A relationship to l2-torsion is established. I will also present a proof of the vanishing of l2-torsion of amenable groups. This was conjectures by Lück.

Zalesskii, Pavel

Profinite Topology, Goodness and mod-p Schur multiplier

We shall discuss residual properties of groups and their interpretation in connection with the profinite completion. According to J-P. Serre a group G is *good* if the cohomology groups of G and its profinite completion $\hat{G}$ are naturally isomorphic on finite coefficients. We shall talk about these properties for groups of geometric and arithmetic nature. We discuss also consequences of the non-finiteness of the mod-p Schur multiplier of a finitely generated group.