Vadim Kaimanovich

Title: Amenability and random walks.

Abstract: I will discuss a recent application of probability methods to proving amenability of a class of self-similar groups.

Ilya Kapovich

Title: On hyperbolicity of the free factor and free splitting complexes.

Abstract: The free factor complex FF_N and the free splitting complex FS_N are two natural free group analogs of the curve complex, and they both come equipped with natural isometric $Out(F_N)$-actions. We show how to derive hyperbolicity of the free factor complex from the Handel-Mosher proof of hyperbolicity of the free splitting complex, this providing a new proof of a theorem of Bestvina-Feighn. We also prove that for the natural projection $\tau : FS_N \to FF_N$ for any two vertices $x, y \in FS_N$, the image $\tau([x, y])$ of a geodesic $[x, y]$ is uniformly Hausdorff-close to a geodesic $[\tau(x), \tau(y)]$. The talk is based on a new joint paper with Kasra Rafi.

Ján Mináč

Title: VISG Very Important Small Galois Groups.

Abstract: Absolute Galois groups of fields play a crucial role in the arithmetic of algebraic varieties, yet in general it is very difficult to put our hands on them. However in several recent remarkable developments including the Rost-Voevodsky proof of the Bloch-Kato conjecture and progress by F. Bogomolov, Y. Tschinkel and F. Pop on a birational anabelian program, as well as in my recent work with S. Chebolu and I. Efrat, it has become increasingly clear that some secrets of absolute Galois groups are already encoded in their small and rather approachable quotients. Interestingly enough one could see the seeds of this progress already in the beginning of the 1980s. I plan to survey and even to interview VISG in this talk.

Denis Osin

Title: Group theoretic Dehn surgery.

Abstract: Thurston's Dehn surgery theorem states that all but finitely many Dehn fillings of a hyperbolic knot complement are hyperbolic. Historically this theorem was the first nontrivial evidence towards the famous Geometrization Conjecture. Another theorem, commonly attributed to Gromov, states that the quotient of a non-elementary hyperbolic group by a high power of an infinite order element is again non-elementary hyperbolic. Iteration of this result yields an easy solution to one of the oldest and most influential questions in group theory, the general Burnside problem. In my talk, I will explain that these results are special instances of a more general theory having many other interesting applications. I will begin with an elementary introduction to Dehn surgery in 3-manifolds, hyperbolic spaces and groups, etc., so no previous familiarity with these notions is required.

Daniel Wise

Title: 3-manifold groups.

Abstract: I will survey the recent developments in our understanding of the nature of the fundamental groups of 3- manifolds.

Nicholas Touikan

Title: On the isomorphism problem for relatively hyperbolic groups (joint with Francois Dahmani).

Abstract: The isomorphism problem asks whether two group presentations $< X \mid R >, < Y \mid S >$ of finite length define isomorphic groups. It is well known that this problem is undecidable in general, but it is reasonable to ask whether this problem is decidable if the groups corresponding to $< X \mid R >, < Y \mid S >$ are known to belong to a given class of groups.

A sequence of results due to Sela, Bumagin-Kharlampovich-Miasnikov, Dahmani-Groves, Dahmani-Guirardel culminate to the decidability of the isomorphism problem in the classes of hyperbolic groups and of toral relatively hyperbolic groups.

After briefly giving the general approach to the solution of the isomorphism problem in the class of non-positively curved groups, I will present my joint result with Francois Dahmani which gives algorithmic and algebraic criteria on a class C of groups which enables us to solve the isomorphism problem for torsion free relatively hyperbolic with parabolics lying in C. As an application we can now solve the isomorphism problem in the class of relatively hyperbolic groups with nilpotent parabolics.