Center for Mathematics at Notre Dame

THEMATIC PROGRAM ON BOUNDARIES AND DYNAMICS

Graduate Student/Post Doc Mini-Course Week

Tuesday 26 – Friday May 29, 2015

University of Notre Dame

LECTURE ABSTRACTS

All talks will be held in 127Hayes-Healy and Coffee Breaks/Registration in 257 Hurley

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Bertrand Deroin (École Normale Supérieure – Paris)
Bifurcations of Random Matrix Products

Alex Furman (University of Illinois - Chicago)
Elements of boundary theory and Lyapunov exponents.

Sébastien Gouëzel (Université de Rennes 1)
Entropy and Drift of Random Walks in Hyperbolic Groups

There are two natural methods to construct random elements in a group: a geometric one (take a point uniformly in a big ball) and a probabilistic one (follow a random walk for a long time). Since these two methods tend to share many properties. Vershik asked in which situations it is possible to mimick the geometric method by using a carefully chosen random walk (which amounts to an equality between the entropy of the random walk, measuring the number of points the walk typically visits, and the speed of escape to infinity, suitably normalized). We will explain that it is never the case in most hyperbolic groups. Along the way, we will see how the geometry of the group and of its boundary interact deeply with the behavior of random walks.

Joseph Maher (University of Staten Island - CUNY)
Random Walks on Groups with Hyperbolic Properties

We shall introduce Gromov hyperbolic spaces and groups, and give some examples. We shall also discuss more general examples of groups which are not hyperbolic but act by isometries on (not necessarily proper) Gromov hyperbolic spaces, which include acylindrical groups such as the mapping class group and Out(F_n). We shall review the argument for convergence to the boundary for random walks on hyperbolic groups, and then discuss how this may be extended to the more general case. Applications include linear progress, sublinear tracking, and identifying the Poisson boundary for acylindrical groups.