Random walks on linear groups

S4D3 - Graduate Seminar on Advanced Geometry

Ursual Hamenstädt and Bram Petri

Contents:

The central question in this seminar will be: "What does the product of a large number of randomly picked matrices look like?". Concretely, let μ be a probability measure on $\mathrm{GL}_n(\mathbb{R})$ and let $g_1, \ldots, g_k$ be matrices randomly picked with respect to μ. We will be studying questions of the form:

- What is the asymptotic behavior of the norms $\|g_1 \cdots g_k\|$ as $k \to \infty$?
- Let $v \in \mathbb{R}^n$ and $f : \mathbb{R}^n \to \mathbb{R}$ a linear functional. What is the asymptotic behavior of the norms $f(g_1 \cdots g_k \cdot v)$ as $k \to \infty$?

The tools we use will be a mix of probability theory, ergodic theory, harmonic analysis and group theory.

Literature:

We will be following the book *Random walks on reductive groups* by Y. Benoist and J.-F. Quint.

Prelimniaries:

Linear algebra, analysis. Measure and integration theory. Basic group theory. Basic functional analysis.

Organizational meeting:

When: 10 July 2018, 12:30
Where: Room 1.007, Endenicher Allee 60