RANDOM WALKS ON MATRIX (SEMI-)GROUPS

SEBASTIAN MENTEMEIER

Let $d \geq 2$. Let A be a *random matrix* taking values in one of the following (semi-)groups:

- $GL(d, \mathbb{R})$, the group of invertible real matrices
- $\mathbb{R}_> \times O(d)$, the group of similarity matrices
- $M(d \times d, \mathbb{R}_\geq)$, the semi-group of nonnegative matrices

Goal: To study properties of the *left* random walk (=product of matrices)

$$\Pi_n \;=\; A_n \cdots A_1,$$

where (A_n) is a sequence of i.i.d. copies of A; and to study its action on $\mathbb{R}^d$.

I will describe the history of the problem, explain what assumptions are needed to prove limit theorems for Π_n and highlight recent research directions.