

PhD research topic proposal
BME, Doctoral School of Mathematics and Computer Science

Name and degree of supervisor :

Imre Péter Tóth, PhD

Are you willing to supervise Stipendium Hungaricum applicants?

yes

Title of the topic:

Statistical behaviour in hyperbolic dynamical systems

Short description:

A fundamental problem in statistical physics is to understand the probabilistic behaviour observed in complicated (e.g. big) physical systems based on the underlying deterministic equations of motion. To approach this goal, we study mathematical models of time evolution in simple systems inspired by physics, where the initial state is chosen at random, but the dynamics is otherwise fully deterministic. We try to prove, for these systems, properties that are otherwise characteristic of stochastic processes - like the law of large numbers, central limit theorems, fast decay of correlations, Poisson process convergence, etc. The candidate can start this work with problems of her/his choice ranging from mixing in 1-dimensional dynamics to heat conduction in Physical models: tasks differing much in complexity (but much less in difficulty).

Requirements:

Probability theory, measure theory

Contact:

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Place of work:

Department of Stochastics