

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

**Name and degree of supervisors :**

Péter Bálint, DSc

**Are you willing to supervise Stipendium Hungaricum applicants?**

No

**Title of the topic:**

Spectral methods in dynamical systems

**Short description:**

Spectral methods provide powerful techniques for studying statistical properties of dynamical systems. For several types of uniformly hyperbolic systems, an appropriate transfer operator is known to have a spectral gap, which in turn implies fast relaxation to equilibrium.

Recently, spectral methods have been successfully applied to (i) models beyond the uniformly hyperbolic class and (ii) further details of the spectrum, such as Ruelle resonances. The task of the PhD candidate is to study extensions to systems of geometric or mechanical origin, in particular, billiard models.

**Requirements:**

A solid background in analysis (including functional analysis). Some background in ergodic theory and dynamical systems is most welcome.

**Contact:**

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**Place of work:**

Department of Stochastics, Institute of Mathematics, Budapest University of Technology and Economics