

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

**Name of supervisor :**

**Bálint Vető**

**Degree:**

**PhD**

**Title of the topic:**

**Asymptotics of exactly solvable models in the Kardar-Parisi-Zhang universality class**

**Short description:**

In the physics literature, a wide class of surface growth phenomena is investigated since the 1980s which appear naturally, e.g. crystal and facet growth, boundaries, solidification fronts, paper wetting or burning fronts. In their seminal paper Kardar, Parisi and Zhang (Phys. Rev. Lett. 56, 1986) gave a stochastic differential equation which is believed and since then partially proved to describe these phenomena. To access the solution of the KPZ equation, various mathematical models for surface growth are studied which mimic this behaviour. These models show the same universal scaling and asymptotic properties and hence said to belong to the KPZ universality class. The PhD candidate is assumed to study the limiting fluctuations of certain models in the KPZ universality class which include interacting particle system models, directed polymers, non-intersecting trajectories and random tiling models.

**Requirements:**

strong background in probability and analysis

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**Place of work:**

Institute of Mathematics, BME

**Statement:** *The conditions of the research above are satisfied, the theme is confirmed by the*

*head of the Department/Institute*