

PhD research topic proposal

BME, Doctoral School of Mathematics and Computer Science

Name and degree of supervisors: János TÓTH, Ph.D.

Are you willing to supervise Stipendium Hungaricum applicants?

Yes

Title of the topic: Problems in Formal Reaction Kinetics

Short description:

The task of reaction kinetics is to investigate the temporal (and sometimes spatial) evolution of chemical reactions. To achieve this goal, both deterministic and stochastic models are formulated and analyzed using the Qualitative Theory of Differential Equations, numerical methods, and other approaches.

Direct problems study the behavior of these models, for example as a function of the graph-theoretic structure of the reactions (rather than the compositions). Inverse problems, on the other hand, aim to determine the model itself or the parameters of a given model based on experimental measurements, which are usually affected by errors.

Specific research topics will be formulated according to the student's background knowledge.

Important: If you join by the end of this year, I will provide you with a supporting letter, provided that we can work together efficiently for one year—i.e., by the end of the following year.

Note: Under the current conditions, you can only sustain yourself financially if you receive additional support beyond the Stipendium Hungaricum scholarship.

Introduction:

Tóth, J., Papp D., Nagy A. L.: *Reaction Kinetics: Exercises, Programs and Theorems*, Springer, 2018.

Requirements:

Elementary knowledge in Differential Equations; LaTeX, Wolfram Language,

Contact:

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Place of work:

BME Building H, Room 311